the OIL AND GAS JOURNAL

NEW

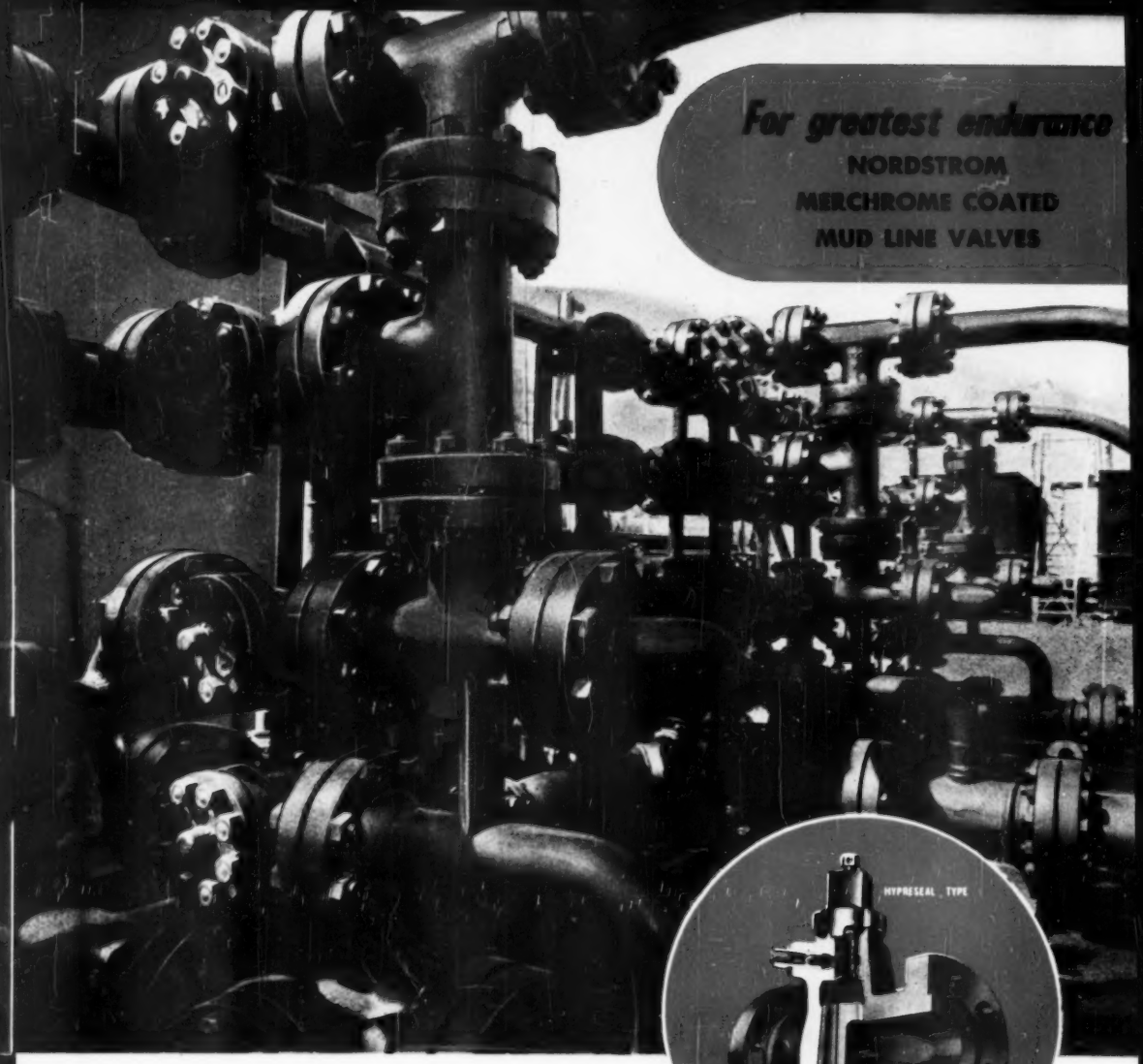
REED 'LB'
ROCK BITS

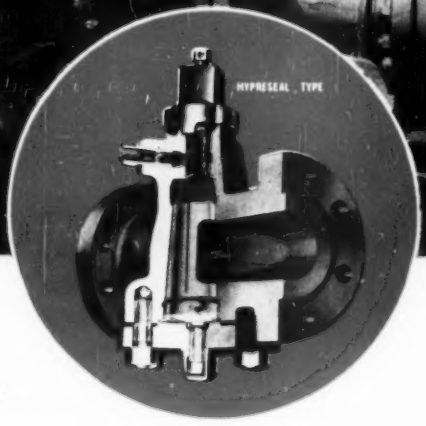
clean the bottom of the hole as they drill — assuring faster penetration and more hole per bit.

REED ROLLER BIT COMPANY
HOUSTON 1, TEXAS

THE MARK OF QUALITY

PRICE 50 CENTS TABLE OF CONTENTS PAGE 41 FEBRUARY 9, 1950





ABRASION-RESISTANT—REPACKABLE UNDER PRESSURE.
POSITIVE PRESSURE SEALED PORTS. UNEXPOSED SEAT.
CONTINUOUSLY LUBRICATED WITHOUT FREQUENT ATTENTION.

Nordstrom Valves

NOW AUTOMATICALLY LUBRICATED WITH Hypermatic

TRADE MARK

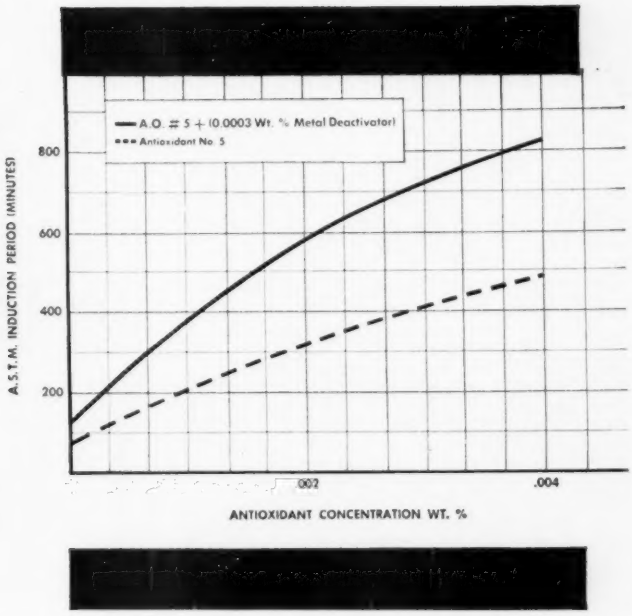
***Nordstrom Valve Division*—ROCKWELL MANUFACTURING CO.**
400 North Lexington Avenue, Pittsburgh 8, Pa., Offices in all principal cities

ROCKWELL

Export—Rockwell Mfg. Co. Empire State Building, New York 1.

Case History:

This chart shows improvement in induction period on thermally cracked stock containing 0.6 parts per million of copper when using Du Pont Metal Deactivator in combination with Du Pont Gasoline Antioxidant No. 5, compared with use of antioxidant alone.



Du Pont Metal Deactivator Reduces Antioxidant Treating Costs of Copper-Contaminated Fuel By 35%

Copper, if present in your gasoline in even trace quantities, may be costing you money through greater antioxidant requirements than necessary. Du Pont Metal Deactivator is the answer to such a problem because, in every case, overcoming the catalytic effect of copper is more economical with Metal Deactivator than an attempt at stabilization with antioxidants alone; and the gasoline containing Deactivator is more stable in storage.

This particular case history shows how in one refiner's copper-contaminated stock the addition of a relatively small amount of Du Pont Metal Deactivator resulted in marked antioxidant savings.

The base stock, a thermally cracked gasoline, contained 0.6 parts per million of copper. Du Pont Gasoline Antioxidant No. 5 was found to be the most effective of the three Du Pont antioxidants and a concentration of .0036 wt. % was required to obtain an induction period of 460 minutes. However, with the addition of only 0.0003 wt. % of Du Pont Metal Deactivator it was possible to obtain a 460 minute induction period with an antioxidant concentration of .0014 wt. %—a reduction in antioxidant treating costs of thirty-five per cent.

If you are not presently using Du Pont Metal Deactivator, you should check this product because copper is apt to be present when least suspected. The nearest Du Pont District Laboratory will be glad to run a Metal Deactivator test on your stocks for you. Call your Du Pont Petroleum Chemicals representative.

DU PONT
REG. U.S. PAT. OFF.

Better Things For Better Living
...Through Chemistry

Petroleum Chemicals

Make Du Pont the Source for All of Your Gasoline Additives ... Tetraethyl Lead Compounds (Motor Mix—Aviation Mix)—Antitoxidants—Metal Deactivator—Dyes

E. I. DU PONT DE NEMOURS & COMPANY (INC.)
Petroleum Chemicals Division • Wilmington 98, Delaware

District Offices: Wilmington, Del. · Chicago, Ill. · Tulsa, Okla. · Houston, Texas · Los Angeles, Calif.

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POWER without Pampering

The ZC Engine . . .

The Fairbanks-Morse ZC Engine is a rough and ready engine . . . ready to take the roughest type of operation in stride. At home in any weather, it needs no pampering to deliver plenty of power for any pumping need . . . thrives on minimum maintenance and attention. See your supply store for the reasons why you'll get more with the ZC. Fairbanks, Morse & Co., Chicago 5, Ill.

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Oil Field Equipment • Diesel Locomotives • Diesel Engines • Pumps • Scales • Motors
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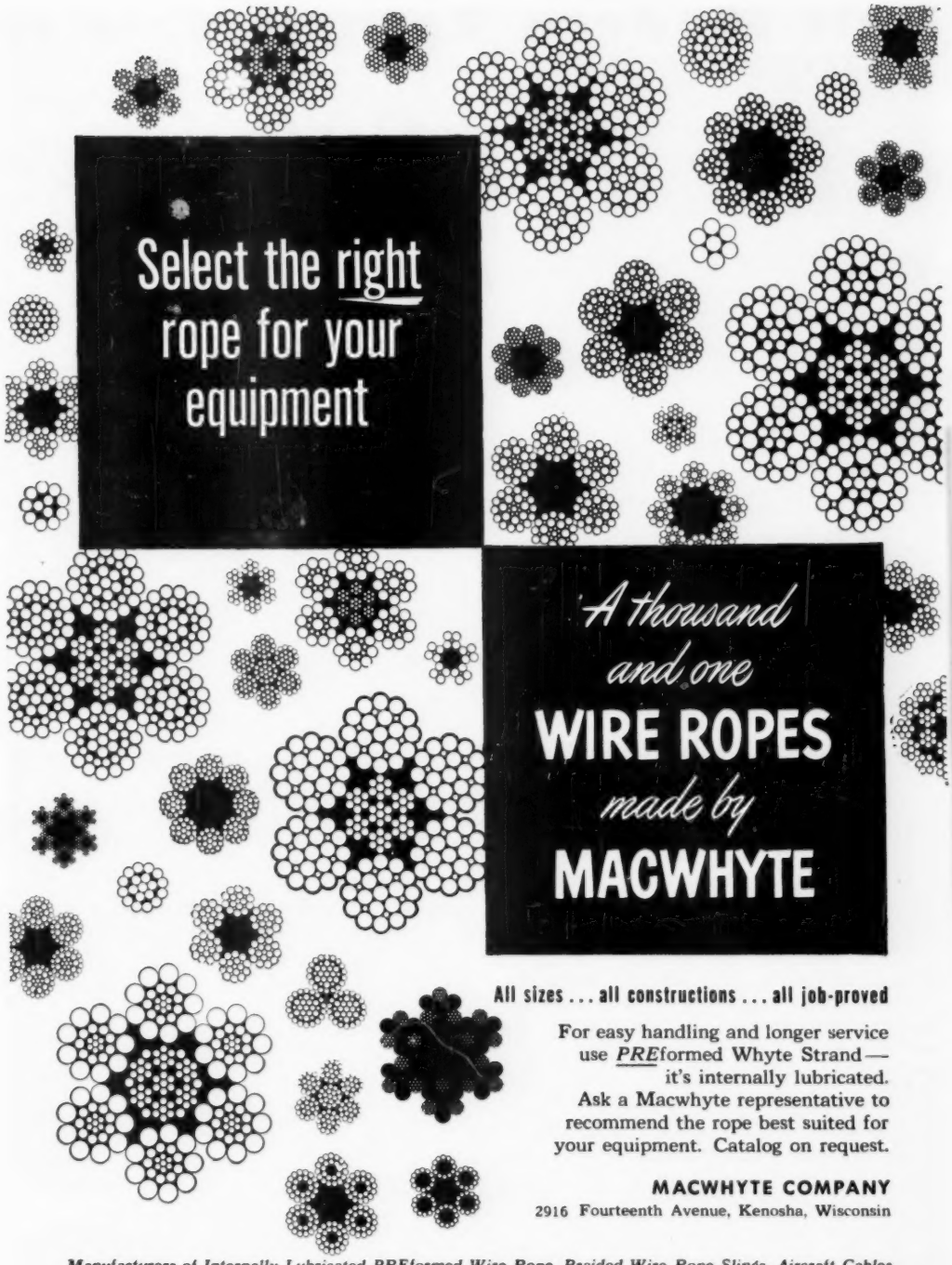

All sizes . . . all constructions . . . all job-proved

For easy handling and longer service use *PRE*formed Whyte Strand — it's internally lubricated. Ask a Macwhyte representative to recommend the rope best suited for your equipment. Catalog on request.

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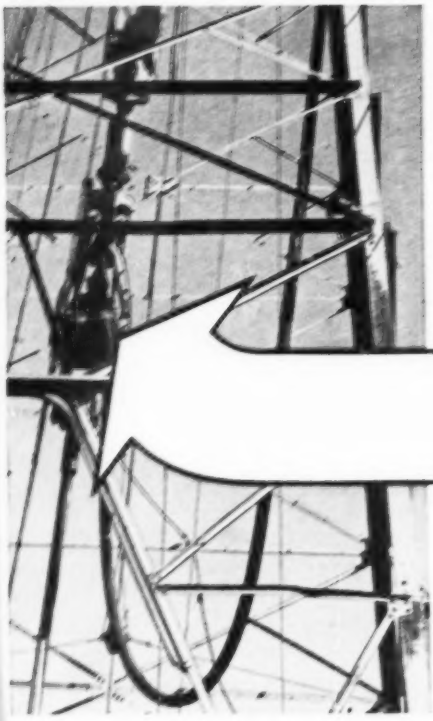
Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal and Stainless Steel Wire Rope. Our distributors and mill depots throughout the U.S.A. and other countries carry stocks for immediate delivery. Mill depots: New York • Pittsburgh • Chicago • Minneapolis • Fort Worth • Portland • Seattle • San Francisco • Los Angeles

978

This Modern Rotary Hose is



Five Ways Better

It's only the beginning for this Ray-Man Rotary Hose. When photographed, it had drilled 13,400 feet of hole in 3 months of service in Mississippi.

You Can Reduce Drilling Costs with Ray-Man Rotary Hose and Type "E" Couplings

1. SUPER-FLEXIBILITY is the basic improvement of Ray-Man Rotary Hose over usual constructions which are heavy and stiff. Manhattan engineers designed a machine to wind high tensile steel-wire under precisioned tension, making possible an entirely new principle of strength in Rotary Hose.

2. STEADINESS in the derrick under working conditions is another Ray-Man characteristic that means longer hose life and reduced costs. The new Ray-Man strength member resists pulsations under pressure.

3. EASIER HANDLING means less danger of damage in trucking from hole to hole and making-up to standpipe and swivel.

4. OIL-PROOF FLEXLASTICS TUBE insures long hose life for all methods of drilling, including oil or oil-base mud.

5. MODERN COUPLING HAS PRESSURE-SEALING FLANGE. Finally, the *Streamlined Type "E" Coupling* features the "Lip-Lok" Pressure-Sealing Flange. The higher the pressure, the tighter the seal. The assurance this gives you against dangerous blow-outs is another important consideration in buying rotary hose that will reduce drilling costs. Make your next hose be your best hose buy. Try Ray-Man Rotary Hose with Type "E" Coupling.

RAYBESTOS-MANHATTAN PRODUCTS FOR PETROLEUM
Have you asked for your copy of our latest catalog? It describes Rotary Hose in detail with V-Belts, Flat Belts, Brake Blocks, Packing, and other products for the Petroleum Industry.

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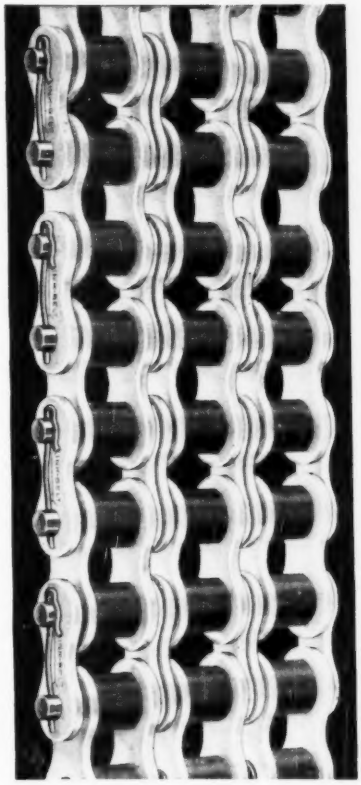
The Oil and Gas Journal, published Thursdays by The Petroleum Publishing Company. Entered as second-class matter September 1, 1910 at post office at Tulsa, Okla., under act of March 3, 1879. U. S. and foreign rates to the petroleum industry, $3 yearly. Copyright 1950

The heavier your load — the greater your need for...

LINK-BELT

Precision Steel ROLLER CHAIN



It's a long way down to the "business end" of holes these days . . . often between three and four miles. That makes a round trip of close to six to eight miles. With drill pipe loads approaching 200 tons, the call is for better and more powerful drives. Link-Belt Precision Steel Roller Chain is the answer.

So well has this strong, flexible, precision finished all-steel chain performed—under the toughest drilling conditions throughout the world—its popularity has leaped ahead among the men who build, the men who buy, and the men who operate drilling rigs.

Assembly and disassembly of Link-Belt multiple-width chains in the field is easy and load distribution across the width of the chain is maintained.

Link-Belt Precision Steel Roller Chain is built to manufacturers' (A.S.A.) specifications in standard sizes, in single and multiple widths. Meeting all drilling requirements, Link-Belt chain is available at your supply store.

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LINK BELT
Precision Steel
ROLLER CHAIN

CHOOSE GUIBERSON
Seal-O-Matic Unions . . . *and let* COLOR *be your guide!*

Choose from these three rugged, heavy-duty unions — they meet every need from 4,000 p.s.i. to 10,000 p.s.i. cold working pressure. Accurate machining of highest quality steel forgings assures interchangeability. The next time you buy unions... *look for the colored wing nuts!*

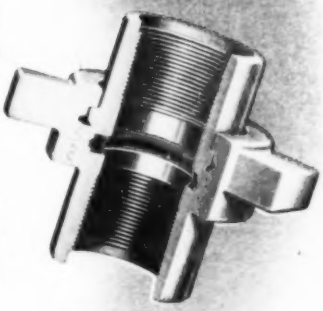
BLUE marks 4000 p.s.i.

YELLOW marks 6000 p.s.i.

RED marks 10,000 p.s.i.

and one of them is right for your job!

SEAL-O-MATICS are the ideal union for every job on mud lines • manifolds • gas and oil lines • hydraulic lines • Christmas trees • blow-out preventers • water or steam lines • cementing and acidizing equipment gasoline or chemical plants • refineries.

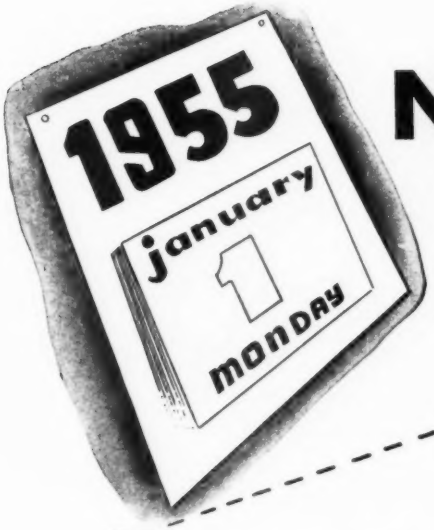


SEAL-O-MATIC RING
An *extra* seal in the 6,000 and 10,000 p.s.i. unions—gives a perfect seal and holds maximum pressures.

READY FOR ROUGH WORK
The 3-lug wing nut with fast-action Acme threads provides quick knock-down or make-up of a strong, leak-proof union.

SOLD BY LEADING OIL FIELD SUPPLY STORES EVERYWHERE

THE GUIBERSON CORPORATION
Dallas, Texas U.S.A.
Established 1919



No, not yet, but....

MARLEY FANS, GEAREDUCERS, DRIVE SHAFTS AND FAN CYLINDERS ARE *FIVE YEARS AHEAD* IN THE FIELD OF COOLING EQUIPMENT . . . since, the HEART of any Cooling tower or DriCooler is these mechanical units, their dependability and performance are of the utmost importance.

Just imagine mechanical equipment of any type . . . particularly 22 foot fans powered by 75 brake horsepower . . . operating 24 hours a day in the midst of a hot, dank jungle! Yet, this is the atmospheric condition under which mechanical units must perform on water cooling equipment.

Recognizing this fact, and realizing that commercial-type equipment was not available to meet these severe conditions, The Marley Company, Inc., decided in the early thirties to design and produce their own.

Today, Marley offers newly designed Geareducers, fans, fan cylinders and drive shafts . . . developed not from theory, not from a few scattered tests over one or two years' time, but backed with the "know-how" gained from MORE THAN 5000 UNITS actually in operation over the past fifteen years! This is 5 TIMES THE EXPERIENCE OF ANY OTHER manufacturer.

Of course, your next Marley DriCooler or Cooling Tower will have this "years ahead" mechanical equipment. But, you can modernize your present installation, if you wish, with Marley mechanical equipment which is now available in a range of sizes to fit most any cooling unit.

If you would like to know more about Cooling Tower or DriCooler Operation, Maintenance, Testing, Water Distribution, Specifications, Water Treatment, Air Movement, and other vitally important cooling problems, MAIL THE COUPON or write today for free, illustrated folders.

MAIL THIS COUPON TODAY OG-2

The Marley Company, Inc., Kansas City 15, Kansas

- ☐ Yes, I would like to have your FREE, illustrated folders on cooling problems.
- ☐ Please have salesman call to discuss our cooling problem.

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Company _____

Street Address _____

City _____ State _____

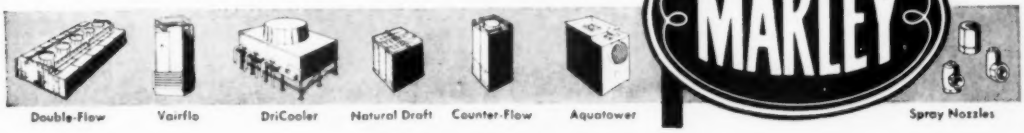
FANS . . . Quiet, cast aluminum alloy or stainless steel, true airfoil sections, adjustable pitch, smooth, efficient, balanced.

FAN CYLINDERS . all bolted construction (not nailed together); tapered throat, non-corrosive materials, high enough for safety, low enough for easy inspection, sized to give close fan tip clearance.

GEAREDUCERS . . . heavy cast iron cases, case hardened nickel-moly steel gears, Parco lubrized pinions, positive lubrication forward and reverse, sized and geared to meet operating horsepower.

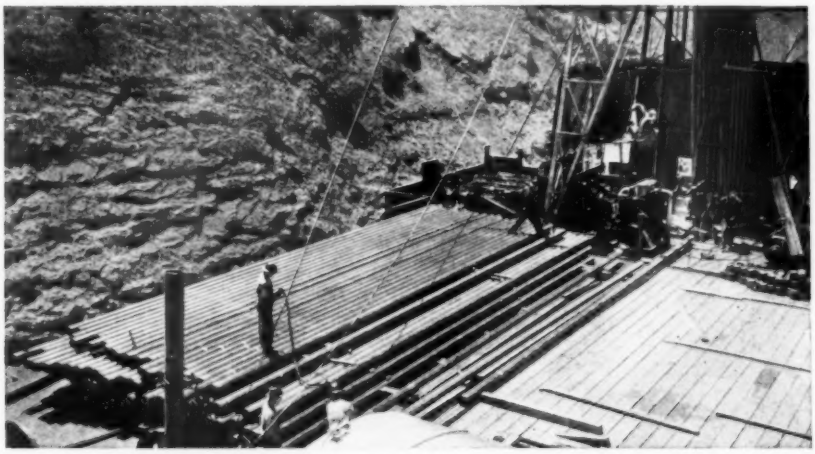
DRIVE SHAFTS . . . Heavy tubular steel with integral yokes, flex-disc couplings, balanced for smooth operation, do not require lubrication.

MARLEY



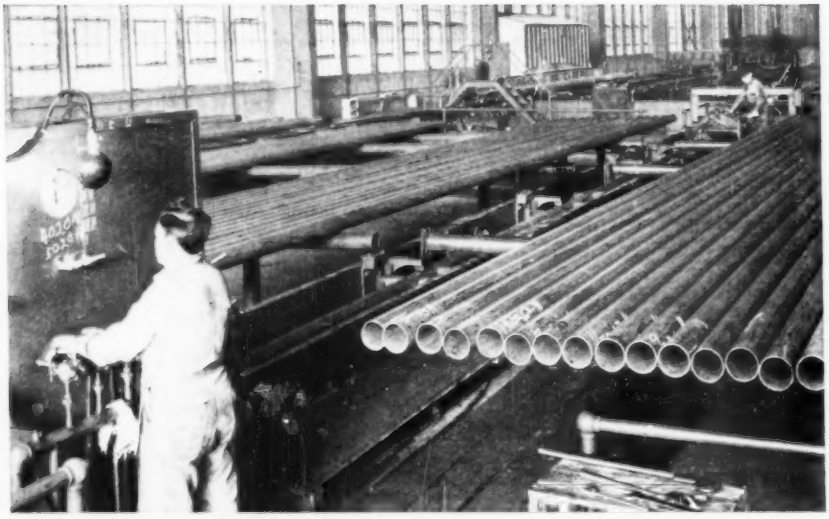
Double-Flow Vairflo DriCooler Natural Draft Counter-Flow Aquatower Spray Nozzles

DEPENDABILITY THROUGH



IN A CALIFORNIA FIELD: Running seven-inch S-80 A. O. Smith Casing.

RESEARCH AND ENGINEERING



IN THE A. O. SMITH PIPE MILL: Hydrostatic-testing S-80 A. O. Smith Casing.

SMITH FORGE 76th ANNIVERSARY 1874 1950

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CORPORATION

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Tulsa 3 • International Division: Milwaukee 1

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Every model *Heavy-Duty Engineered* to save you money!

Now International puts you squarely in the driver's seat—with a complete new line of completely new trucks!

Every single new International Truck from 4,200 to 90,000 pounds GVW is heavy-duty engineered to give you lower maintenance and operating costs.

Let the facts tell that story:

Fact No. 1: for 18 straight years Internationals have led in sales of heavy-duty trucks (16,001 pounds and over GVW). The men who buy heavy-duty trucks buy on a basis of performance. They choose Internationals.

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Here's relaxing roominess! Here's all 'round visibility! Here's a comfortable, adjustable seat! Yes—you get everything in the Comfo-Vision Cab!

You have full visibility in the one-piece Sweepsight windshield. That convenient two-cluster instrument panel puts everything right in front of your eyes.

And when the truck starts to roll, you find that new Super-steering right for position, and positive control.

AND TALK ABOUT FEATURES...

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NEW Brake Systems—hydraulic or air. Faster-acting, surer-stopping, longer-wearing—more efficient braking with less effort.

NEW Outdoor Visibility—Giant, one-piece scientifically curved Sweepsight wind-shield, large side windows, two rear windows.

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NEW Steel-flex Frames—Designed to provide an extra margin of strength combined with the right amount of flexibility.

NEW Comfo-Vision Cab—Model for model "the roomiest cab on the road"—with comfort cushions, adjustable seats, controlled ventilation.

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NEW Rear Axles for any job—Wider, sturdier rear axles—hypoid single-speed, double-reduction and two-speed with electric shift.

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Plus dozens of new features and refinements throughout every truck!

Proved in the mountains!

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Every model proved under actual operating conditions!

There wasn't any price tag on the test program to prove the new International Trucks.

It was directed by men whose life work has been to develop better truck transportation. Test drivers were chosen as carefully as you do any key workers. All-outdoors was used for proving grounds. Laboratory analysis tests were backed up by track tests, then by actual road tests. Test convoys were run 'round the clock.

That's why every all-new, all-proved International Truck is right and ready for you *now!*

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2 more

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for Hilton Drilling Co.

Great Bend, Kansas

WHEN it comes to buying engines, drillers base their decisions on their own and others' past experience. That's why we say the Murphys we've already sold are our best salesmen. Good examples are the two Murphy Diesels shown in the photo at the right. These were purchased in 1946 by the drilling department of the Crown Oil Company (now operating as the Hilton Drilling Co., Great Bend, Kansas). The service these engines have given and are giving sold Hilton on selecting another Murphy powered rig in 1949.

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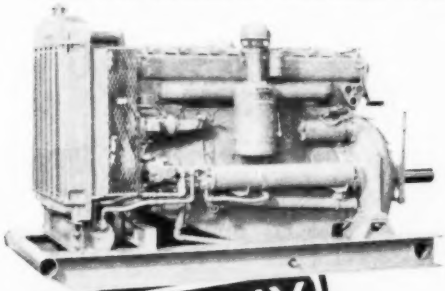

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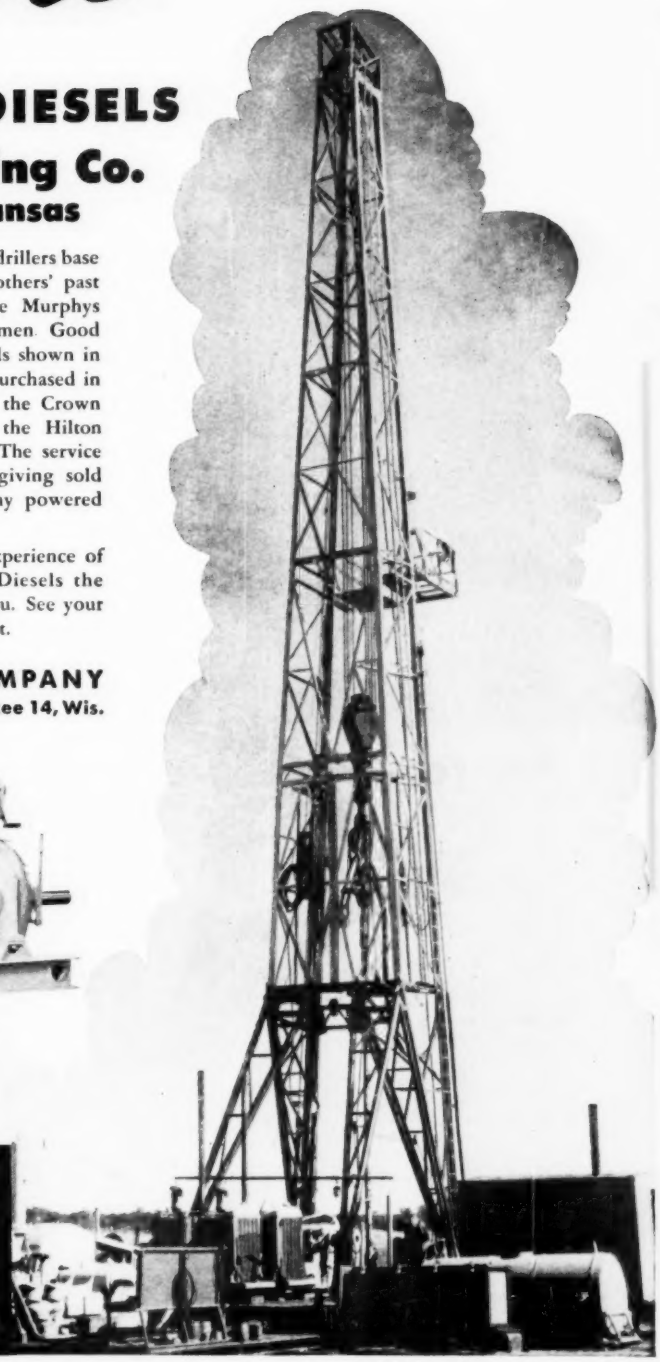
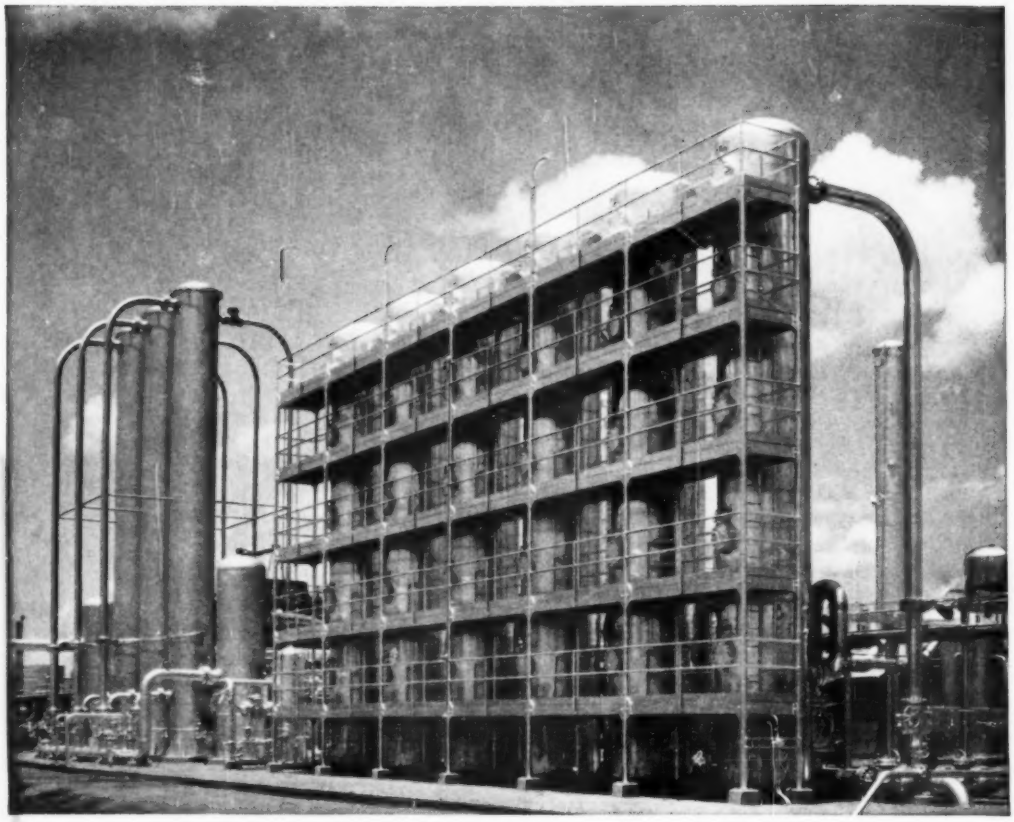
Heavy duty power

for the oilfields

Murphy Diesel Engines and Power Units for drilling and pipe line pumping, 90 to 220 H.P. Generator Sets 60 to 133 K.W.





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FOR downright toughness—sheer ability to take it and come back for more—there's nothing else like Pittsburgh Finishes. For no others are formulated more accurately or tested more thoroughly at the factory and in the field to make certain that they are as good as human skill and ingenuity can make them.

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Our wide experience in making coatings for the petroleum industry may be helpful to you—and save you time and money. Call on us for advisory service.

We'll be glad to send you a copy of our new booklet on Aluminum Paints and Paint Vehicles upon request.

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PAINTS • GLASS • CHEMICALS • BRUSHES • PLASTICS

PITTSBURGH PLATE GLASS COMPANY

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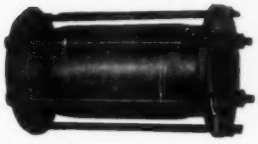

DRESSER LONG SLEEVES

(Style 40) simplify pipe joining. Span gaps between pipe ends. No threading, exact fitting or aligning. Ideal joint at wells, separators, pumps, engines and tanks.

DRESSER COUPLINGS

(Style 38) speed laying of field, gathering and transmission lines; save time on hookups; absorb vibration at pumps, engines and compressors. 100% salvageable in relocating temporary lines.

DRESSER SPLIT REPAIR CLAMPS

(Style 79B) for quick repair of pitholes and longitudinal splits in pipe. Furnished with either one or two shells—an inexpensive "bandage" which saves cutting out short sections of damaged pipe.

DRESSER COLLAR CLAMPS

(Style 4,41) stop leaks through threads of screw collars, without service interruption. Band Clamps (Style 77B), Porous Weld Clamps (Style 55), and other pipe repair devices also available.

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Super Excelo TRANSMISSION BELTING FOR HARDEST STRESSES AND STRAINS

• Today's production requires the highest degree of strength and endurance in transmission belting. The belting must pull any number of wells that pumping units are designed to operate. It needs to withstand constant racks, tugs and jolts. The belt should be equal to operations under maximum loads. The belting must stand up, thereby preventing costly delays . . . AND REPUBLIC'S SUPER EXCELO BELT WILL DO ALL OF THESE THINGS. Super Excelo is a homogeneous structure that resists fatigue and can take external and internal punishment constantly. It keeps operating costs at their lowest. Ask your distributor for Republic transmission belting.

MECHANICAL RUBBER GOODS BY
REPUBLIC RUBBER DIVISION

REPUBLIC RUBBER DIVISION
LEE RUBBER & TIRE CORPORATION . . . YOUNGSTOWN, OHIO
Lee DeLuxe Tires & Tubes, Conshohocken, Pa.

HERE ARE THE FACTS ABOUT THE MUCH-DISCUSSED

Cameron

NON-LUBRICATED LIFT-PLUG VALVE

It has no exact counterpart in any previous valve design.
All of the advantages of gate and plug valves, and none of the disadvantages of either type, are combined with new, exclusive Cameron innovations.

IT IS NON-LUBRICATED — No grease of any kind is required to effect a seal. This feature reduces the chance for human error and eliminates lubrication maintenance cost. **PRESSURE-SEALING DESIGN**— When the plug is seated, line pressure automatically forces the seat into tighter engagement with the plug. Thus, pressure which adversely affects the geometry of the fit between the plug and seat on ordinary plug valves, making lubrication essential, actually contributes to the high sealing efficiency in the Cameron "LP" Valve. **UNIQUE LIFT-PLUG ACTUATOR**—A novel mechanical design which lifts, turns, and reseats the plug in a continuous turn of the lever. **RENEWABLE CORROSION RESISTANT SEAT AND PLUG** — Easily replaced when damaged; permits any desired trim. **FIELD REPAIR**—The Cameron "LP" Valve can be completely overhauled without removal from the line; no special tools or skill required. **EASY OPERATION**— Requires less operating effort than other valve designs. **CAMERON FORGED STEEL**—All parts, including body, are press or drop forged from specification materials.

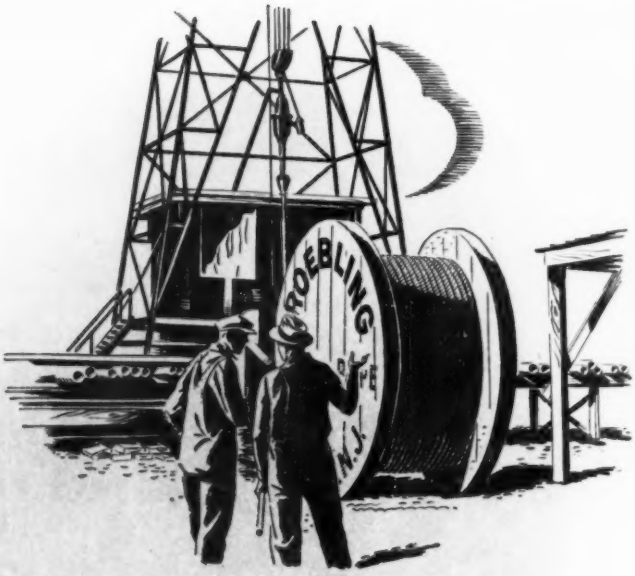
Cameron

IRON WORKS, INC.

P. O. BOX 1212, HOUSTON, TEXAS

EXPORT: 74 TRINITY PLACE, NEW YORK, N. Y.

As rotary drilling lines, Roebling 6x19 Preformed "Blue Center" Steel Wire Rope with Independent Wire Rope Core has demonstrated extra life on the job and substantial dollar savings.



For rope research and developments that help you save...

Today it's Roebling!

JOHN A. ROEBLING'S SONS COMPANY, TRENTON 2, NEW JERSEY

YEAR BY YEAR, industry makes new and more stringent demands upon wire rope . . . and Roebling leads in developing types that meet these demands with utmost efficiency and economy.

Take Roebling Preformed "Blue Center" Wire Rope with Independent Wire Rope Core!

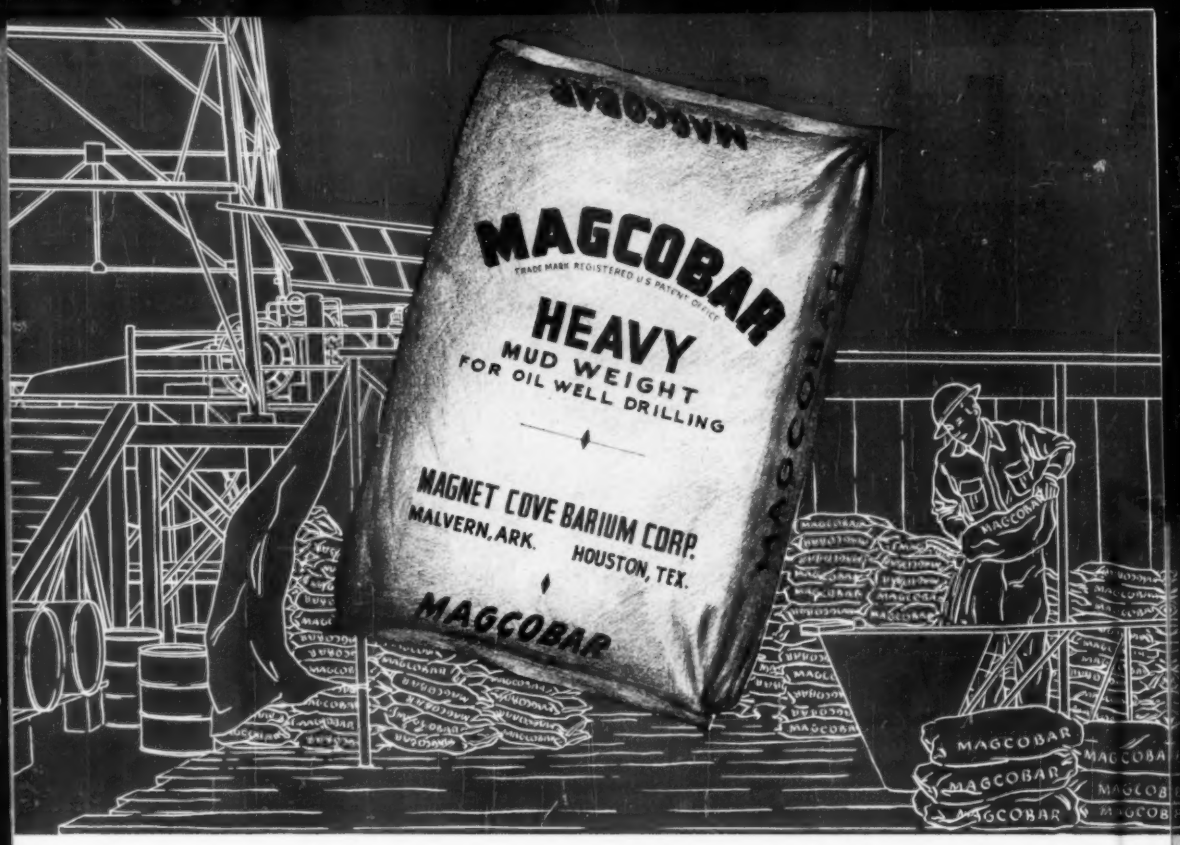
No finer rope has ever been made, and its basis is "Blue Center" steel—an exclusive Roebling development. Its high resistance to abrasion, shock and fatigue spells long life . . . To this, Roebling *Preforming* brings the further advantages of new handling ease and improved performance . . . And the addition of I.W.R.C. assures top resistance to operating pressures and provides increased rope strength.

Roebling makes a wire rope of the right construction, grade and size for every type and make of rope-rigged equipment. Have your Roebling Field Man recommend the best rope for low-cost performance on each of your installations.

ROEBLING

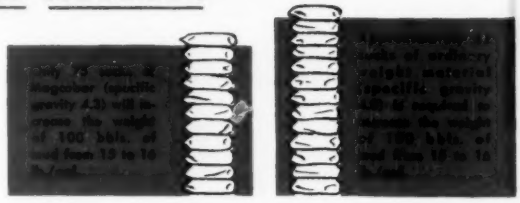
A CENTURY OF CONFIDENCE

DISTRIBUTED BY
THE NATIONAL SUPPLY COMPANY
REPUBLIC SUPPLY COMPANY



MAGCOBAR LOWERS MUD COSTS BECAUSE FEWER SACKS ARE NEEDED!

When increased weight is the problem, experience in the field has confirmed laboratory proof that muds weighted with Magcobar have a lower viscosity and are much easier to control than muds weighted with other materials. Magcobar can be used in all types of muds. The superior properties of this specially prepared barium sulphate are most evident in very high weight muds; however, its use will result in substantial savings in all muds. Look for the Magcobar sign as your guide to lower mud costs. More than 250 Magcobar Dealers from Canada to the Gulf Coast are ready to serve you.



Magcobar is a free-flowing powder which is easily mixed with mud through a jet hopper mixer. Muds weighted with Magcobar weighing 20 lb./gal. (150 lb./cu. ft.) are being used successfully in drilling.

MAGNET COVE BARIUM CORP.

MALVERN, ARK. HOUSTON, TEXAS

Export Representative:
Daniels, Beckley and Associates,
30 Rockefeller Plaza, New York 20, N. Y.

LOOK FOR THIS SIGN WHEN YOU NEED MUD

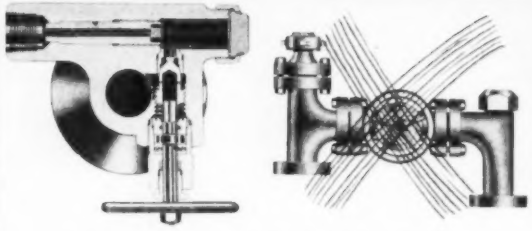
MAGCOBAR • MAGCOGEL • HIGH YIELD DRILLING MUD • XACT CLAY • FIBER-SEAL • MAGCO-MICA • TANNATHIN • JEL-OIL MUD • JEL-OIL "E" • SALT GEL NOHEEV • SEAL FLAKES • MY-LO-JEL • CHEMICALS

Magcobar
Complete
DRILLING MUD SERVICE
DEALER

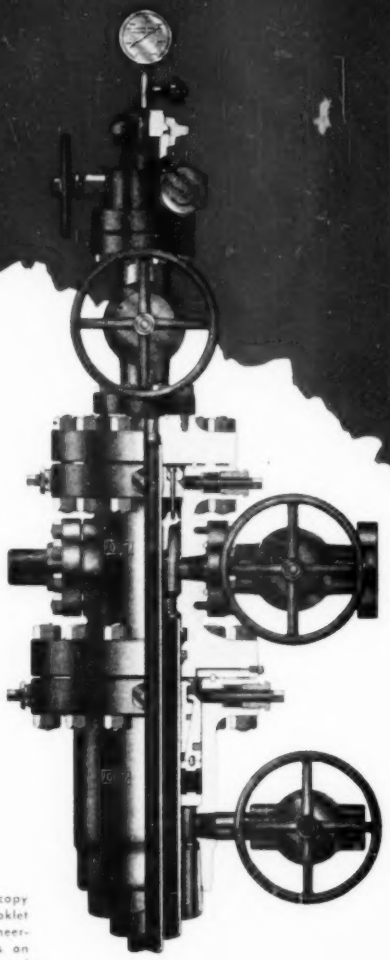
O-C-T "JE"

FLOW CONTROL UNITS

Save more than 90% over conventional tubing wings!

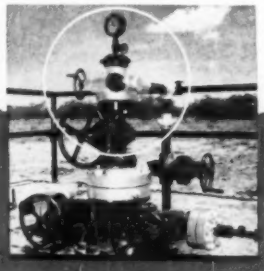


In a single, compact unit, the O-C-T "JE" Flow Control Unit replaces a tee or cross, wing valve, choke and bottom hole pressure adapter.



This compact, easy operating O-C-T "JE" Flow Control Unit . . . adaptable to either positive or adjustable chokes . . . performs the functions and takes the place of a Christmas Tree cross or tee, wing valve, adjustable or positive choke and the upper bottom hole pressure connection adapter. It eliminates the flange connections between the tee and the bottom hole test adapter, between the tee and the wing valve and between the wing valve and the choke. Thus, O-C-T "JE" Flow Control Units effect a cost saving ranging as high as 90 per cent when used to replace 10,000 lb. test conventional wings. In addition, O-C-T "JE" Flow Control Units effect weight savings up to 70% . . . operate free and easy at high pressures . . . provide quick, easy field maintenance.

O-C-T "JE" Flow Control Units are now proved in service by more than 2000 installations. They are available through all recognized supply stores.



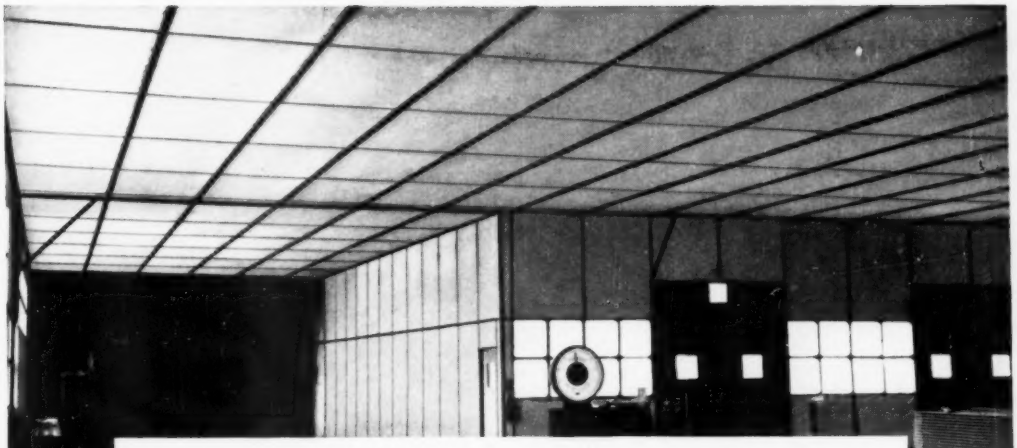
The operator of this 6000 lbs. test O-C-T Christmas Tree made a substantial saving when he specified the "JE" Flow Control Unit.

Write today for your free copy of a 16-page illustrated booklet which gives complete engineering specifications and prices on the "JE" Flow Control Unit and conventional wings.

Oil Center Tool Co.

P. O. Box 3091, Houston, Texas

Export Representatives: Venezuela, Colombia, Peru, and Ecuador—Berry & Hall, Apartado No. 304, Maracaibo, Venezuela—Sterling Areas—La Grand, Sutcliff & Gell, Ltd., Southall, Middlesex, England. Address Export Inquiries for All Other Countries to P. O. Box 3091, Houston 1, Texas.



For OUT-SIDING...IN-SIDING...and CEILING, too

K&M *"Century"* APAC filled the bill

The total bill for the job was held down by the K&M APAC Asbestos-Cement sheets used for all walls and the ceiling of this serviceable structure. And no bill for APAC maintenance is ever even likely. The same sort of economy goes with K&M APAC on any project. Enclosure is quicker because APAC sections—large, strong, but not bulky—are easy to handle. Permanence is as certain as it can be made by a material that defies weather and fire, rust and rot, rodents and termites.

The K&M APAC Asbestos-Cement formula gives you a tough, attractive, money-saving material for panels, partitions, sheathing, shaft casings, bins—all flat areas. Apply APAC over insulation board, wood studs, solid wood sheathing, steel or wood girts. You don't even need to paint APAC! Standard thicknesses: $\frac{3}{16}$"—$\frac{1}{4}$"—$\frac{3}{8}$"...Standard sheet size—easy to cut on the job—is 4' x 8'. For name of your nearest distributor, and all particulars, write to us.

Nature made Asbestos...
Keasbey & Mattison has made it serve mankind since 1873

KEASBEY & MATTISON
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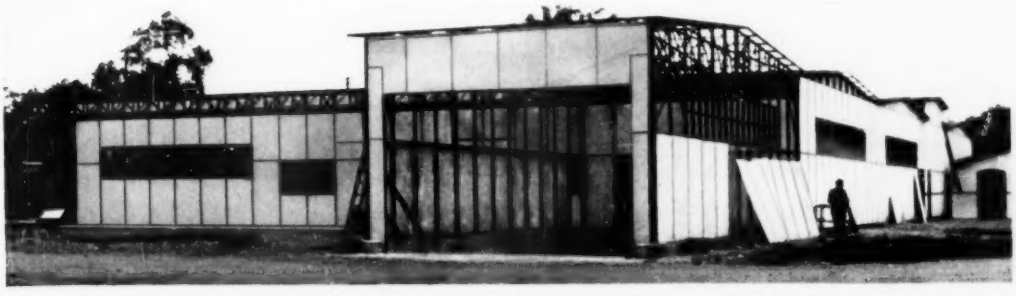
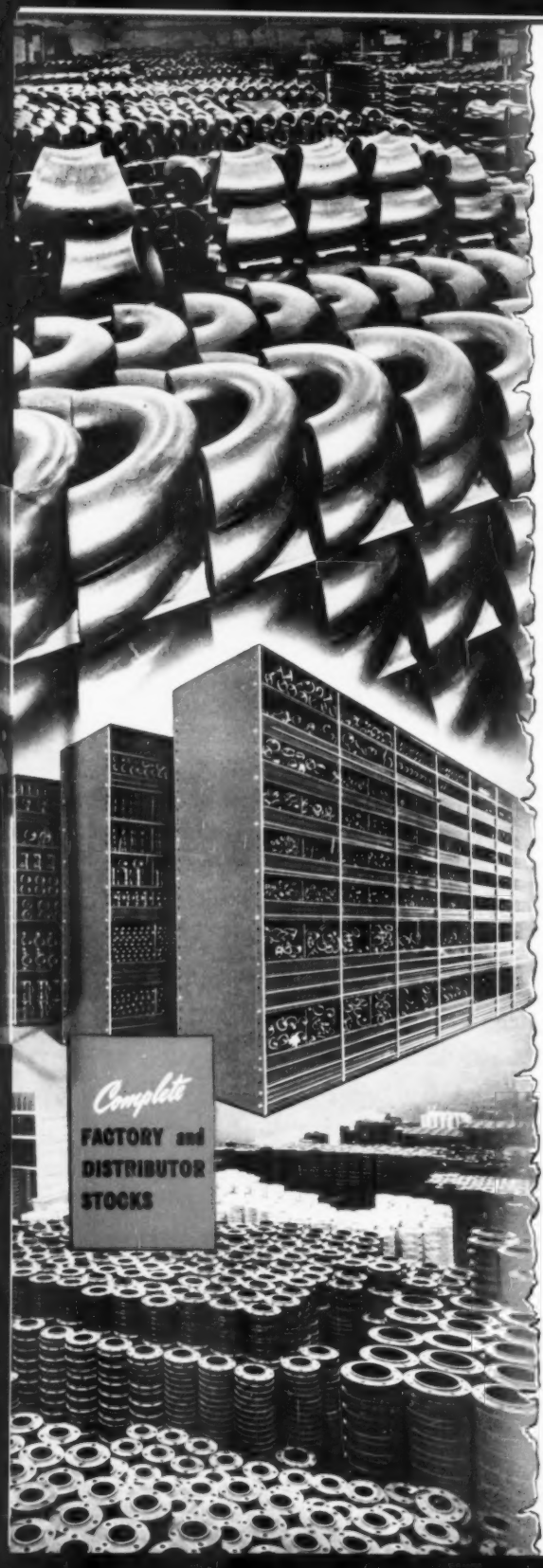
Designed and constructed by Unistrut Corporation, Wayne, Michigan.
Exterior: K&M APAC. *Interior:* K&M APAC. *Ceiling:* K&M APAC.





all three on one order from Ladish

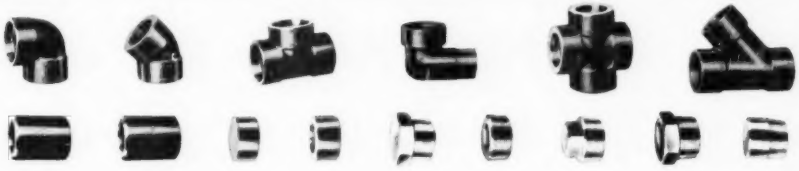
TO MARK PROGRESS

every piping system deserves the protection

SEAMLESS WELDING FITTINGS—½ INCH THRU 30 INCHES

FORGED STEEL FLANGES—½ INCH THRU 30 INCHES—LARGE O.D. THRU 96 INCHES

FORGED STEEL FITTINGS—SCREWED AND SOCKET WELDING—⅛ INCH THRU 4 INCHES



All Available in

CARBON
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STAINLESS STEELS
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Means savings in time and dollars...for LADISH offers you a complete line backed with adequate stocks

Whatever your fitting requirements . . . you can rely on the Ladish line for an unrestricted selection of Seamless Welding Fittings, Forged Steel Flanges and Forged Steel Fittings.

This Controlled Quality line is complete in types, size ranges and materials you need for virtually any application. Ladish also gives you such outstanding engineering developments to improve piping efficiency, as Seamless Reducing Elbows and Full Branch Taper Design Tees.

Adequate stocks in strategically located distributor warehouses . . . supplemented by extensive factory inventories of every type . . . give you double assurance of prompt service on every Ladish order. And, by standardizing on Ladish you know that every fitting is made to the unsurpassed standards of Controlled Quality for complete dependability.

of *Controlled Quality* fittings

A COMPLETE LINE PRODUCED UNDER ONE ROOF
. . . ONE RESPONSIBILITY

LADISH CO.

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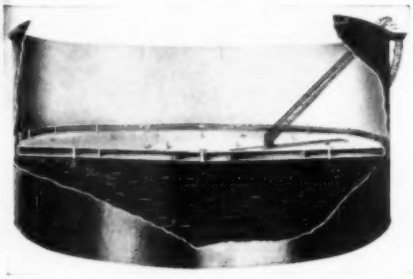
GRAVER FLOATING ROOF TANKS



Cut-away view showing details of Graver Double Deck construction.

• The Full Double Deck construction of the Graver Floating Roof effectively provides "profit protection" in both the production and finished product stages. It is especially recommended for its resistance to the corrosive action of "sour crude"...or for the storage of finished petroleum products in areas too isolated for practical manifolding...and where excessive differences in filling or withdrawal exist, as in a deep water terminal.

Fabricating the finest in *each* type of tank, Graver is in a position to determine which will best fit your particular situation and deliver maximum protection against vapor losses and corrosion. Take a look at the record of Graver Conservation Equipment...talk it over with Graver engineers. Prompt information and recommendations will answer your call, letter or wire.

GRAVER

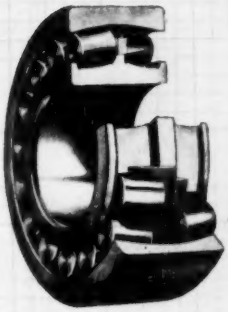
FABRICATED PLATE DIVISION

GRAVER TANK & MFG. CO., INC.

EAST CHICAGO, INDIANA

NEW YORK • PHILADELPHIA • CHICAGO • CATASAUQUA, PA. • HOUSTON • SAND SPRINGS, OKLA.

keeping a whip hand over the drill string...



TORRINGTON BEARINGS

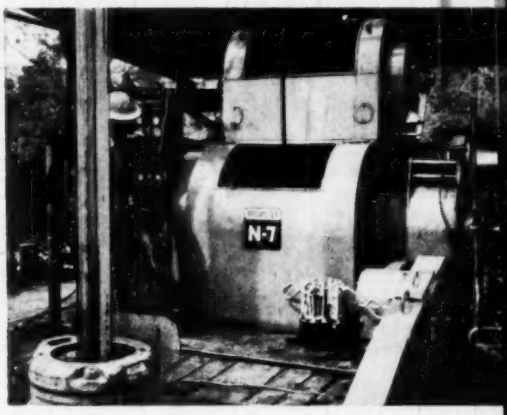
It takes rugged equipment to control a mile and a half of drill pipe lashing around at high speed.

To handle heavy loads in rotary tables, The Brewster Company specifies Torrington Angular Contact Ball Bearings. They carry not only the thrust load but also the radial load imposed by the driving gear and unbalanced weight.

In the drawworks, where shafts are subject to deflection, Torrington Spherical Roller Bearings are used to insure smooth operation and long life.

These are typical examples of Torrington's ability to solve all kinds of friction problems. This experience with all major types of anti-friction bearings can be helpful in making your equipment give more dependable service. Why not consult our engineers on your next bearing application?

THE TORRINGTON COMPANY
South Bend 21, Ind. • Torrington, Conn.
District Offices and Distributors in Principal Cities of United States and Canada



TORRINGTON *SPHERICAL ROLLER* **BEARINGS**

SPHERICAL ROLLER • TAPERED ROLLER • STRAIGHT ROLLER • NEEDLE • BALL • NEEDLE ROLLERS

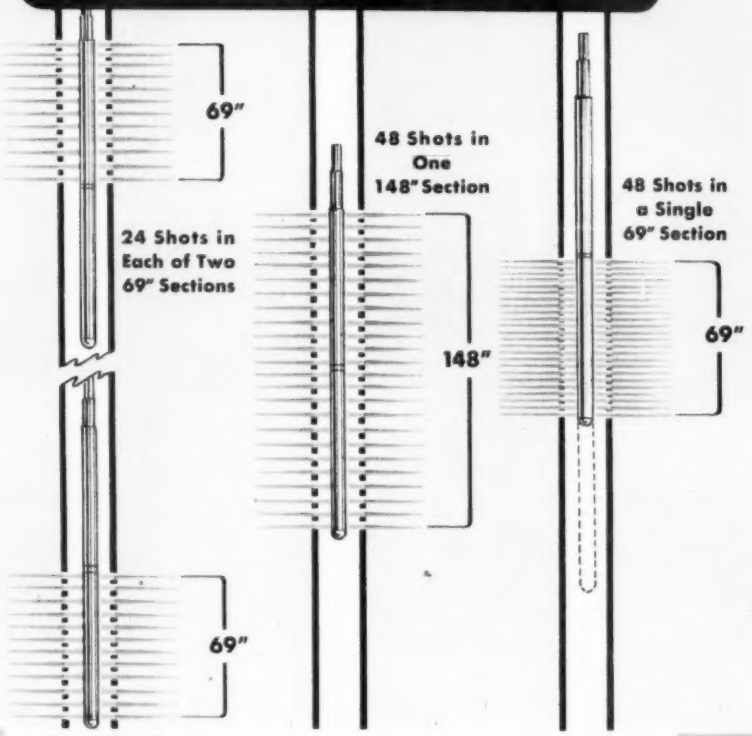
Look

WHAT YOU GET

WITH **LANE-WELLS**

F-2 KONESHOT GUN

Semi-Selective Shaped-Charge Perforating On One Run!



Ask Your

LANE WELLS *Man!*

LOS ANGELES • HOUSTON • OKLAHOMA CITY

LANE-WELLS CANADIAN COMPANY • PETRO-TECH SERVICE CO. IN VENEZUELA

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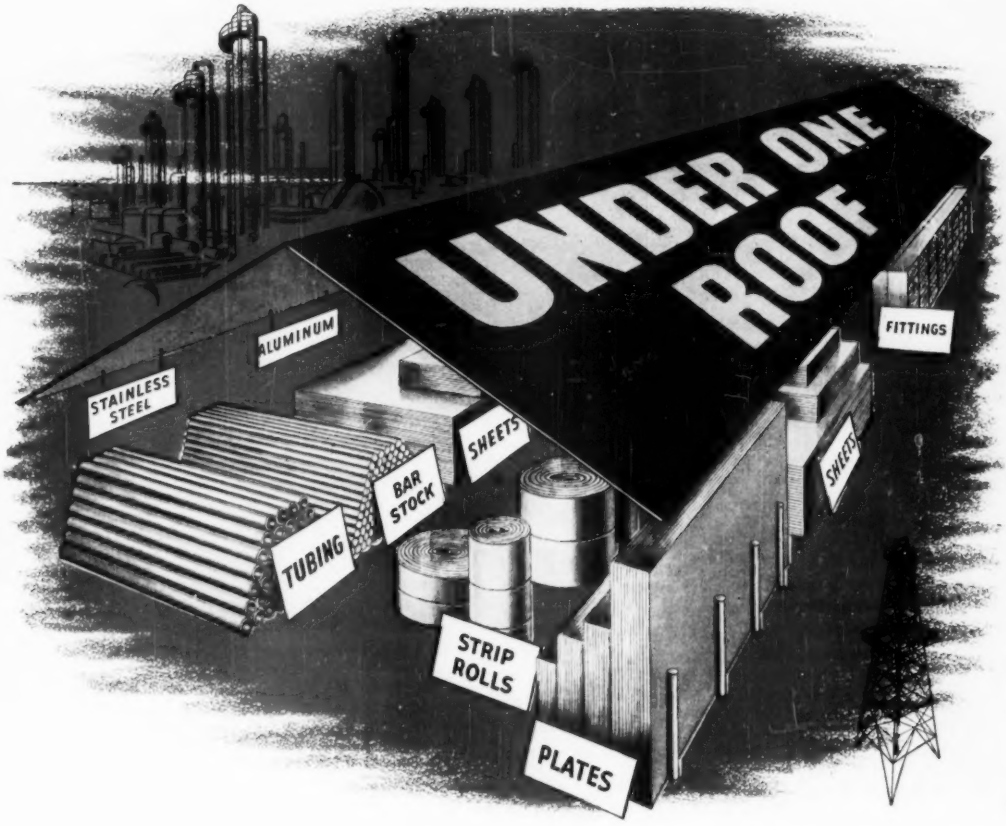

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"One-call service... for on-call metals"

Geared to industry's continuous demand for specialized metals, Metal Goods' one-call service is designed to make your metal procurement easier — and more efficient. By having the metals you need "on-call" from your Metal Goods warehouse — *when* you need them — you can eliminate costly metal inventories... save storage space... reduce materials handling... and gain efficiency through simplifying your supply effort.

Metal Goods warehouses are strategically located to serve you quickly and dependably. Sheets, Plates, Tubes, Bars, Fittings and Accessories of... **STAINLESS STEELS ALUMINUM • BRASS • COPPER • MONEL* • NICKEL* • INCONEL***

Plus... complete stocks of Condenser and Heat Exchanger Tubes... Admiralty... "Alclad" Aluminum... 70/30 Super-Nickel, Monel.

Tube Sheets... Naval Brass... Muntz Metal

Fittings and Accessories

Consult your Metal Goods metallurgical specialist on the proper metal for your application.

*Not warehoused in Kansas City or St. Louis

Phone, wire or write your Metal Goods warehouse for your specialized metal needs.

Do you have the "Metalog"? It's a complete stock list and metal manual — Write for it!

MGC

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21 Smart ideas

ONLY FORD GIVES YOU A CHOICE OF V-8 OR SIX

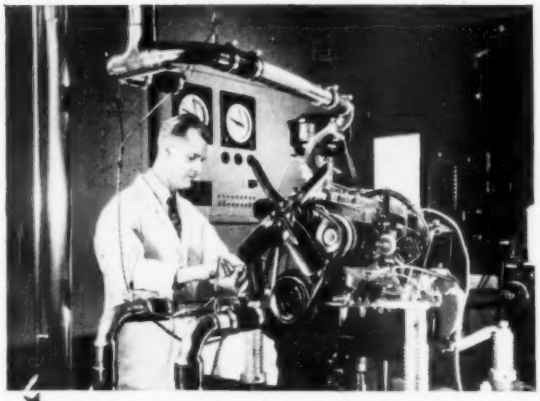
The Ford Truck line for 1950 gives you new models, new ratings, new power, new features—21 smart ideas in all, to help cut trucking costs.

NEW MODELS like the F-3 Parcel Delivery, which expand the 1950 Ford Truck line to over 175 models. This wide selection means that you should see your Ford dealer for the right truck for you, no matter what you haul. New G.V.W. rating increase on Series F-6 and F-8.

NEW POWER like the brand-new 6-cylinder Rouge 254 truck engine. Thus, for 1950 you have a choice of four great engines, two Sixes, and the only two V-8's in trucking. Only Ford gives you a choice of V-8 or Six.

NEW FEATURES like the full air brakes now available on the 1950 F-8 Big Jobs . . . single-speed axles for the F-6 and F-8 . . . new Synchro-Silent transmissions . . . new features that make driving safer and easier.

New models! New ratings! New power! New features! You'll find all these smart ideas in Ford Trucks for 1950. And you'll find the smartest idea of them all . . . Bonus Built construction which means big reserves of strength and power. That's why a 1950 Ford Truck is the smart buy for you. Your Ford Dealer can arrange quick delivery on most models. See him today!



★ **NEW 110-HORSEPOWER SIX!** The new Rouge 254 makes the 1950 Ford F-6 the most powerful 6-cylinder Ford Truck ever built. The thoroughly proved 254 has Free-Turn exhaust valves, Autothermic pistons, chrome-plated top piston ring, High-Lift camshaft, and many other power-producing, cost-saving, smart ideas. ★ A brand-new, 4-speed Synchro-Silent transmission engineered for quiet operation, easy shifting and long life is standard with the new 254 engine.

Model F-2; 5,700 lbs. G.V.W. Express or Stake

Model F-1; 4,700 lbs. G.V.W. Panel, Pickup or Stake

Model F-3; 6,800 lbs. G.V.W. Express or Stake

Model F-5; 14,000 lbs. G.V.W. Wheelbases; 134, 158 and 176 in.

Model F-4; 10,000 lbs. G.V.W. with Duals

Model F-3 Parcel Delivery Wheelbases; 104 and 122 in.

America's No. 1 Truck Value!

No. 1 in sales gains. Registration figures show Ford Trucks are scoring bigger sales gains than *all other makes combined*, based on the latest three months, compared to the first three months of 1949!

No. 1 in choice of engine types. Only Ford gives you a choice of V-8 or six-cylinder engine design.

No. 1 in experience. Latest registrations prove that 2,003,155 Ford Trucks on the road have marked up 18,567,865 truck years of experience . . . a record equalled by no other truck.

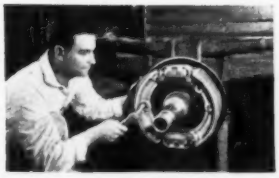
No. 1 in long life. Using latest registration data on 6,106,000 trucks, life insurance experts prove Ford Trucks last longer.

No. 1 in value. Over 175 models! The only V-8's in trucking! Two 145-h.p. Big Jobs rated up to 39,000 lbs. They're Bonus Built which means big reserves of strength and power.

Ford Trucks Cost Less Because—

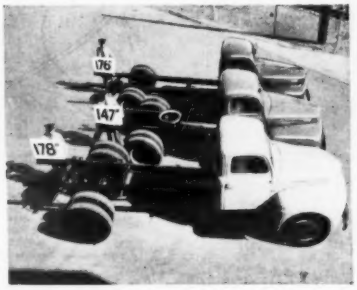
for 1950!*

—IN A FULL LINE OF OVER 175 TRUCK MODELS!



★ **NEW F-7 REAR BRAKES!** Big 15" x 5" hydraulic, dual cylinder. High torque self-centering action both forward and reverse.

★ **NEW AIR BRAKES** available on the Ford Series F-8 Big Job combine smooth flexibility with immediate, positive action.



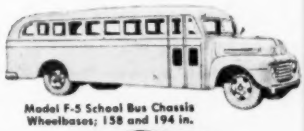
★ **NEW WHEELBASES!** Three of them for 1950 Ford Trucks. Series F-5 and F-6 now have a 176-in. wheelbase for bodies in the 15-ft. range. The 145-horsepower Ford Big Jobs have added two new wheelbases to get a total of five. First, a 147-in. wheelbase for tractors and dump trucks. Second, a 178-in. wheelbase for 15-ft. bodies.

★ **NEW PARCEL DELIVERY!** Forward control chassis with grille, windshield and quarter-windows. You add your choice of bodies. Available in Series F-3 and F-5 (Special order).

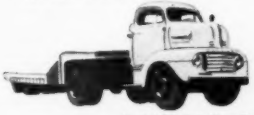
★ New single-speed rear axle for F-8 ★ New extra-heavy duty clutch with 254 engine ★ Million Dollar Cab ★ Air Wing door glass ventilators ★ Level Action cab mounting ★ New Double Channel frame for Big Jobs ★ Gyro-Grip Clutches ★ New single-speed axle for F-6 ★ Roll Action Steering ★ New extra H. D. drive line with 254 engine ★ Quadrax rear axles ★ 4 engines—choice of V-8 or Six ★ New heavy duty, 3-speed Synchro-Silent transmission available for F-1 thru F-3 ★ Choice of over 175 models ★ Bonus Built construction.

One of many 145-horsepower Ford F-8 Trucks operated by Michigan Motor Freight Lines, Inc. of Detroit, Mich.

Model F-5 Cab-Over-Engine
14,000 lbs. G.V.W.



Model F-5 School Bus Chassis
Wheelbases; 158 and 194 in.



Model F-6 Cab-Over-Engine
16,000 lbs. G.V.W.

Model F-6; 16,000 lbs. G.V.W.
Wheelbases: 134, 158 and 176 in.

Model F-7; 19,000 lbs. G.V.W.
35,000 lbs. G.T.W.

Model F-8; 22,000 lbs. G.V.W.
39,000 lbs. G.T.W.

FORD TRUCKS LAST LONGER

Using latest registration data on 6,106,000 trucks, life insurance experts prove Ford trucks last longer!

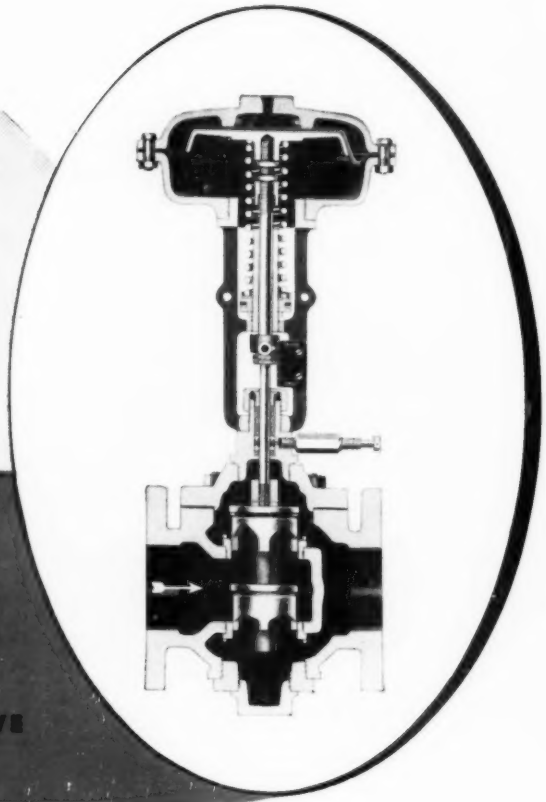
WHEN YOU'RE LOOKING FOR HIGH LIFT AND WIDE BAND PROPORTIONAL CONTROL...

Don't Overlook

The New

SERIES 77

DIAPHRAGM MOTOR VALVE



Here's an inexpensive high-lift valve with sensitivity and flow control characteristics normally found only in higher priced valves. It is ideal for automatic control installations where the controlled variable must be maintained within very close limits.

Outstanding features of the Series 77 include:

- *Negligible hysteresis in the superstructure . . . less than 2%.*
- *Equal percentage control characteristics with a 50 to 1 rangeability.*
- *Premolded Neoprene Diaphragm with patented Rolling Action.*
- *Lubricated stuffing box.*
- *Compact construction . . . requires little space for mounting.*
- *Inexpensive . . . in original cost and in upkeep.*

Your local Honeywell engineer is as near as your phone. Call him in for a discussion of the Series 77 in terms of your applications.

WORLD'S LARGEST ORGANIZATION FOR ADVANCED INSTRUMENTATION AND CONTROL — COMMERCIAL · RESIDENTIAL · INDUSTRIAL

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For Extremely Low Hydrogen Content Weld Deposits

with no under bead cracking, minimum porosity, low spatter loss and ample penetration

No. 312 Electrode for Mild Steel (E-6016)
No. 394 Electrode for High Tensile Steel of High Hardenability (E-10016)

Due to the extremely low hydrogen content of the weld deposits, Airco No. 312 (all position A-C or D-C) is especially recommended for welding hard-to-weld steels (without preheating) such as hardenable steels . . . high sulphur free machining steels . . . cold rolled steels . . . low alloy or mild steels where stress relieving cannot be employed . . . and steels to be vitreous enamelled after welding.

Airco No. 394 (all position A-C or D-C) provides low hydrogen content weld metal deposits of *high tensile strength* on hardenable steels without pre-heat or post-heat treatment. It is also used on carbon steel containing 0.30% or more carbon and should be used on steel containing alloying elements in addition to a high carbon content.

For more information about Airco Nos. 312 and 394 Electrodes, write your name and address on the margin below and send it to your nearest Airco office or authorized dealer for a copy of Catalog ADC-650A.

More news about AIRCO products

NO. 387 ELECTRODE (E-6012)

A high speed all position electrode (D-C or A-C) — ideal for welding mild steel when fit-up is poor. It exhibits excellent operating characteristics, particularly when welding vertically down, and produces a minimum of spatter. Airco No. 387 maintains a high degree of welding performance throughout the entire length of the electrode when high currents are used.

NO. 375 ELECTRODE

Specifically designed for producing machinable welds in cast iron. Deposits are smooth and uniform, bonding well with the cast material; free from internal and surface porosity; and make water-tight joints. Also, color of deposits will approximate that of cast iron. No. 375 can be used in all positions with A-C or D-C.

AIRCOLITE HARDFACING ALLOY

This new alloy (for oxyacetylene and electric application) is especially recommended for pulverizer hammers, coke crusher rolls, and similar parts, subject to *severe abrasion and medium impact*. With one application of this wear-retarding material, the service life of both new and worn parts is increased, in some cases, at least 25 times.

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Air Reduction supplies Oxygen, Acetylene and other industrial gases . . . Carbide . . . and a complete line of gas cutting machines, gas welding apparatus and supplies, plus arc welders, electrodes and accessories. Ask us about anything pertaining to gas welding and cutting, and arc welding . . . we'll be glad to help you.

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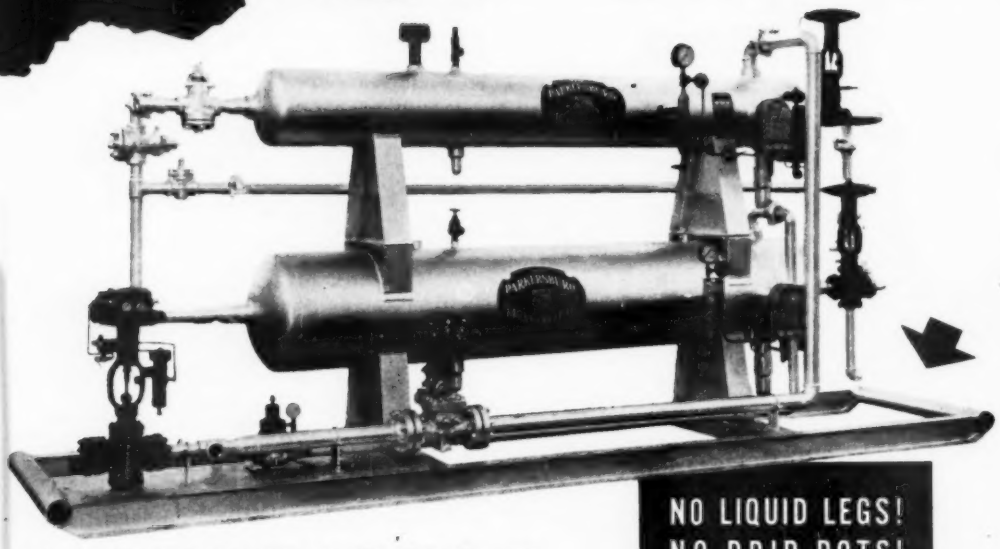

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HORIZONTAL SEPARATORS

more efficiently arranged for
MULTIPLE-STAGE SEPARATION

This extremely compact and easily portable two-stage horizontal separator unit is made possible because liquid legs, drip pots, or other vessels are unnecessary with Parkersburg Horizontal Separators. Elimination of such supplemental vessels is the result of Parkersburg's exclusive No-Bleed Liquid Level Controller and the extra large shell size of the separator.

The extra large shell size provides longer retention of gaseous liquid in the vessel for more efficient separation over a larger interface area between gas and liquid. Other features which contribute to the superior performance of these Parkersburg Horizontal Separators are: Flow Selector Plates that provide for faster discharge of gas-free oil; Coalescing and defoaming element breaks up incoming fluid into largest possible droplets; Improved mist extractor completely removes all entrained liquid from gas stream; Skimmer pipe provides additional scrubbing and discharges only gas which is free of entrainment.

If you require a portable separator, it will pay you to get details of this unit from your nearest Parkersburg Representative or write for bulletin, "Parkersburg Type 'S' Horizontal Separators."

PARKERSBURG RIG & REEL COMPANY
PARKERSBURG, WEST VIRGINIA

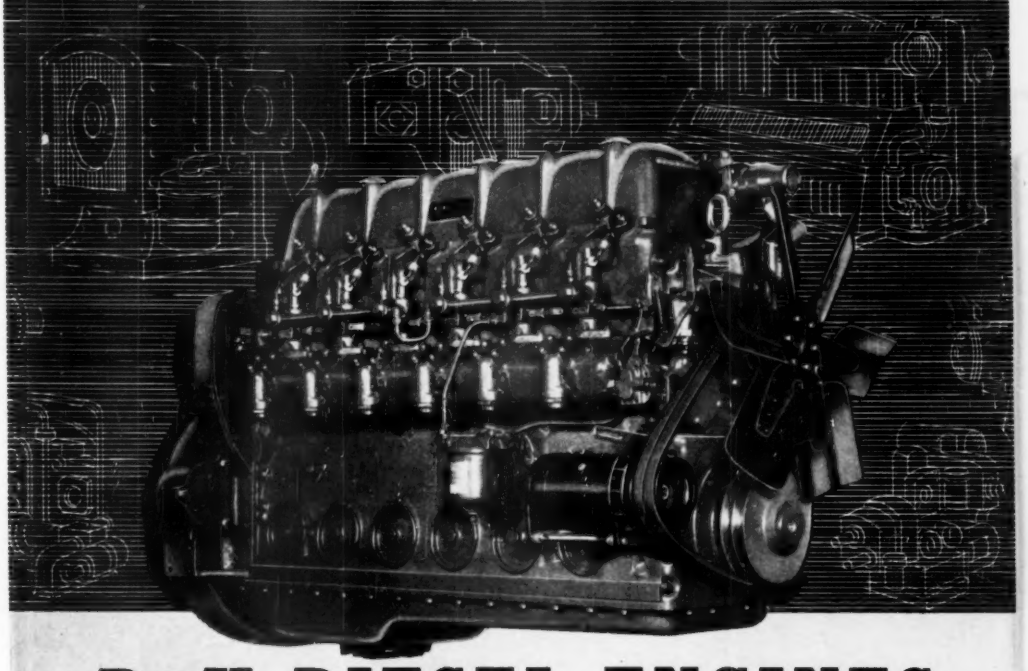
NO LIQUID LEGS!
NO DRIP POTS!
NO EXTRA VESSELS!

The No-Bleed Liquid Level Controller operates within a very close range, controls liquid within a very small fraction of an inch and requires but a few inches of fluid for the float. It is mounted directly on the separator.

AD No. 4911

PARKERSBURG

Outstanding
AMONG DIESELS



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More power per pound of weight — all major castings are of lightweight alloys.

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Rugged — built for the toughest job known — excavator service. Ready for any service. It pays to standardize on P&H Diesels. For complete information, write Diesel Division, Harnischfeger Corporation, Port Washington, Wis.

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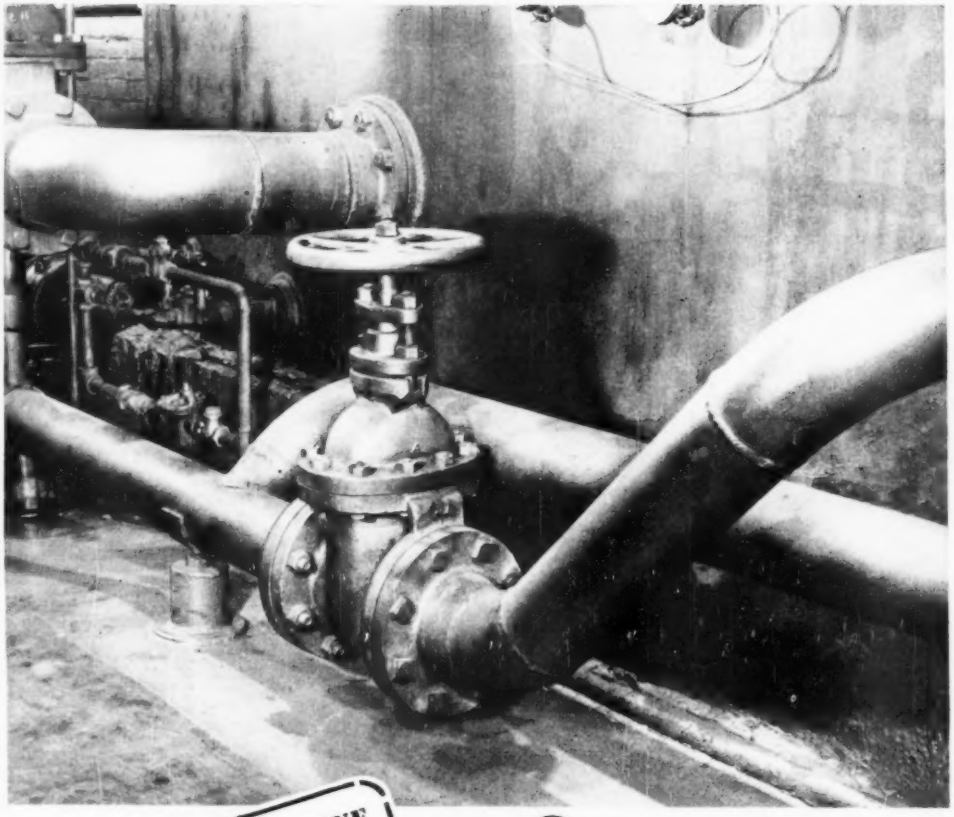
How to cut corners that cost



ANOTHER JOB DONE BETTER WITH GLOBE WELDING FITTINGS

PIPING "corners" can be costly—costly in initial installation, continual maintenance, flow resistance, pressure-loss, erosion, and corrosion.

You can "cut the corners that cost" with Globe Welding Fittings. Installation is simpler—faster. Your piping is safer, stronger with less weight — needed space reduced — insulation is easier and faster. There is less chance for erosion, corrosion, and leakage to develop because of the smooth inner walls, true radii and circularity of Globe Welding Fittings. Liquids and gases flow smoothly with less resistance and pressure-loss.

Decide to "cut the corners that cost" on your next piping job —specify and use Globe Welding Fittings, produced from Globe seamless steel tubes by the Globe Precision Process.

GLOBE STEEL TUBES CO., Milwaukee 4, Wisconsin

Producers of Globe seamless stainless steel tubes — Gloweld Welded stainless steel tubes — carbon — alloy — seamless steel tubes — Globeiron seamless high purity ingot iron tubes — Globe welding fittings.

For complete information on sizes and types send for Globe Welding Fittings Catalog.

GLOBE PRECISION PROCESS WELDING FITTINGS

Over 15 MILLION FEET OF HOLE HAS BEEN SURVEYED

WITH *Eastman*

MULTIPLE SHOT SURVEY INSTRUMENTS

Yes, over 15 million feet of hole surveyed, equivalent to the distance between San Francisco and New York . . . a record of which Eastman can boast.

A survey by this precision instrument records the deviation and direction of the course of the well during a single run of the instrument—in either cased or open holes.

Surveys are made by highly trained and experienced engineers, ready to assist you day or night—

You NEED MULTIPLE SHOT SURVEYS TO . . .

1. Ascertain sub-surface course of well for record purposes.
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3. Provide a permanent record of well course for use in future operations, such as perforating, re-drilling, or deepening.
4. Determine the ideal point to start side-tracking operations.
5. Locate sub-surface zones which may be sliding.
6. Check possible dog legs in open holes before casing is run.

KNOW THE COURSE OF YOUR WELL—CALL THE EASTMAN OFFICE NEAREST YOU.

Section of multiple shot film.

Literature on any of our services will be mailed upon request.

22 OFFICES FOR YOUR CONVENIENCE

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OIL WELL SURVEY COMPANY

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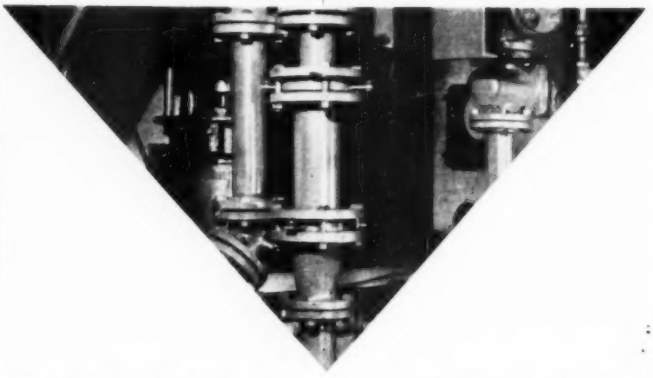
SARAN
LINED
steel
pipe

available immediately — readily field fabricated

resists corrosion



Saran's unusual resistance to most corrosive chemicals and solvents plays an important part in the reduction of shutdowns and lost production! Saves time and labor!

Saran lined steel pipe is available in maximum lengths of 10 feet and in sizes from 1 to 6 inches inclusive. Also available are saran lined plug valves, Saunders type diaphragm valves, flanges, reducing flanges, flanged fittings, gaskets and fittings with union ends.

Write us today for further information concerning saran lined steel pipe and how it may help solve your production problems. Manufactured by The Dow Chemical Company, Bay City, Michigan, distributed nationally by Saran Lined Pipe Company.

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another
DOW
product

They Say—

Fixed Gas Prices

"We must not permit our association to support a law establishing a minimum price for natural gas.

"I have said that before, and so far TIPRO has taken no such action nor has it given any indication that it might. However, a peculiar chain of events recently gave rise to speculation that it might, which leads me to express again my own personal convictions on the subject.

"An article by Will Mann Richardson concerning primarily the wide variations in price paid for Texas gas was carried in the last issue of the Reporter. A leading oil writer for one of the wire services inferred from a statement of Mr. Richardson's that TIPRO might support a minimum price as a remedy for unjustified price variations. Editors, including one as far away as Philadelphia, used the item for speculation on the prospect of Texas' joining Kansas and Oklahoma in fixing gas prices.

"Most recently a writer for The Oil and Gas Journal (January 12 issue, page 38) commented that TIPRO 'may take the lead in this movement' for a a minimum price, 'though it has not endorsed any specific type of action.'

"The association has endorsed no such action. I believe it never will."

J. Ed Warren, president, Texas Independent Producers and Royalty Owners Association, writing in the TIPRO Reporter.

Standard Confusion

"Esso Standard Oil Co. of Pennsylvania, a wholly owned affiliate of our operating company, was absorbed by Esso Standard Oil Co. effective at the close of business December 31, 1949. The change in designation is another step in the direction of clarifying in the public mind the identity of the Esso manufacturing units.

"Surveys have shown that the public tends to think of the various petroleum companies having the word "Standard" in their name as being part of one large company. During the past 5 years a cross-section of the American people have been asked by poll-takers whether they considered Standard Oil of Indiana, Standard Oil of California, and other Standard companies as all one company or each as an entirely separate company. Results indicated that 58 per cent thought of them as "all one company."

"Not all of the confusion, however, exists in the minds of people who are in no way affiliated with Esso. Polls

taken among employes indicate that many are not sure of what Esso Standard consists. The same doubt, surveys have shown, is prevalent among Esso dealers."

The Esso Refiner, Esso Standard Oil Co.

Enthusiastic Reader

Sir:

It's no wonder your magazine has attained the record heights mentioned in your recent item, "Top o' the World" (January 19, page 23). You deserve top rating because the publication really does its job.

I personally save more complete issues of The Oil and Gas Journal than all others together, and clip more articles from the ones passed on to the waste basket than from any periodical of any kind or type. The material in the O. & G. J. is worth reading and worth saving.

More power to you and may your enviable records stand long, and bring you success and satisfaction.

A. M. LOCKHART, partner, Envoy Petroleum Co., Long Beach, Calif.

Withering Market

"It is not comfortable for the American oil man abroad today to face withering markets and the prospects of being totally excluded from large world areas as a result of what I believe to be narrow and unwise concepts. What is happening to oil in the world today is not important only because oil is involved, but because the great British Commonwealth and sterling area seems firmly embarked upon economic and financial practices which can only divide and weaken the free democratic nations in dangerous times. The problem is not only the sacrifice of American foreign oil investments on the altar of the Dollar Gap. The basic issue is whether we are heading toward an expanding world economy and higher standards of living, or whether we are going backward to suffer once again the effects of rampant economic nationalism, bilateralism, and discrimination. The United States taxpayer providing Marshall Plan aid has the right to insist that these grants to other countries shall not be used to wreck the foreign industrial activities of his fellow Americans."

W. F. Moore, president of Arabian American Oil Co., writing in the Annual Review and Outlook issue of the Commercial and Financial Chronicle.

Wrong Impression

"Regret your Standard Oil birthday chart in January 23 issue gives Life's readers net impression that descendants of original five founders of Standard Oil today dominate and have in one connected system a vast industrial empire including everything from U. S. Steel to Minute Maid

Rugged tools . . . . twice as strong as you would expect such slim, streamlined handles and thin-walled sockets to be.

"The Choice of Better Mechanics"

Oil field men like this set because it is way over par in performance . . . the tools are strong and easily adaptable to a variety of jobs.

They squeeze into tight places and get those hard-to-reach nuts and bolts that defy the ordinary type wrench. Recently designed by Snap-on engineers, they have the new features that make fast, easy work of the tough jobs.

INCLUDED IN THE SET: 1/4" and 5/16" single broached sockets; 11 double broached sockets from 3/8" to 7/8"; a speeder wrench, sliding tee, 8" reversible ratchet, nut spinner and universal joint, plus a 3", 6" and 12" extension. All complete in a metal box for only **$27.65**

Present Owners — *Supplement your present set with these special Ferret tools . . . . .*

CLUTCH-TYPE SCREW DRIVER
Handles clutch-type (figure 8) head screws. Built short for easy operation in close quarters.

RATCHET ADAPTOR
Converts any combination of Ferret handle, extension and socket into a reverse action ratcheting tool.

PLASTIC GRIP HANDLE
A shockproof, plastic handle, 5¼" long that is ideal for electric work. Makes your Ferret Set more useful.

DOUBLE HEX FLEXOCKETS
Saves a lot of tough work fumbling for hard to get at studs and bolts. Eight sizes: 5/16" to 3/4".

FERRET FLEXTENSION
A flexible steel cable extension connects handle and socket to work around corners and over obstructions.

EXTRA LONG FERRET SPEEDER
36½" long, 27" shank. Radius of sweep is 3¾". "Palm-Grip" handle rotates to provide easy operation.

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Enclosed find ☐ check ☐ Money Order or
☐ Company Purchase Order for the $27.65 Snap-on Ferret Set.
☐ Please send illustrated brochure describing 109 individual Ferret units.

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They'll Drink It DRY...

The Sovabead Team, S/V Sovabead and S/V Sovabead W, adsorbs more moisture from your natural gas than any desiccant in common use!

These little "men" with prodigious thirsts represent S/V *Sovabead*—Socony-Vacuum's *proved* method for adsorbing moisture in your natural gas dehydrators.

S/V Sovabead is a unique, bead-type desiccant for drying natural gas. It permits installations to operate with break point capacities of 10 to 15% or even higher depending on conditions of operation!

The hard, durable beads are uniform in size, easy to handle, offer minimum resistance to gas flow, eliminate caking difficulties. They're unexcelled for drying sour gas, too! Reactivation is quick, easy, and economical. Gas producers say S/V Sovabead is the most efficient desiccant they ever used!

Get all the facts about S/V *Sovabead*—and how it can improve *your* operation. Call your Socony-Vacuum Representative.

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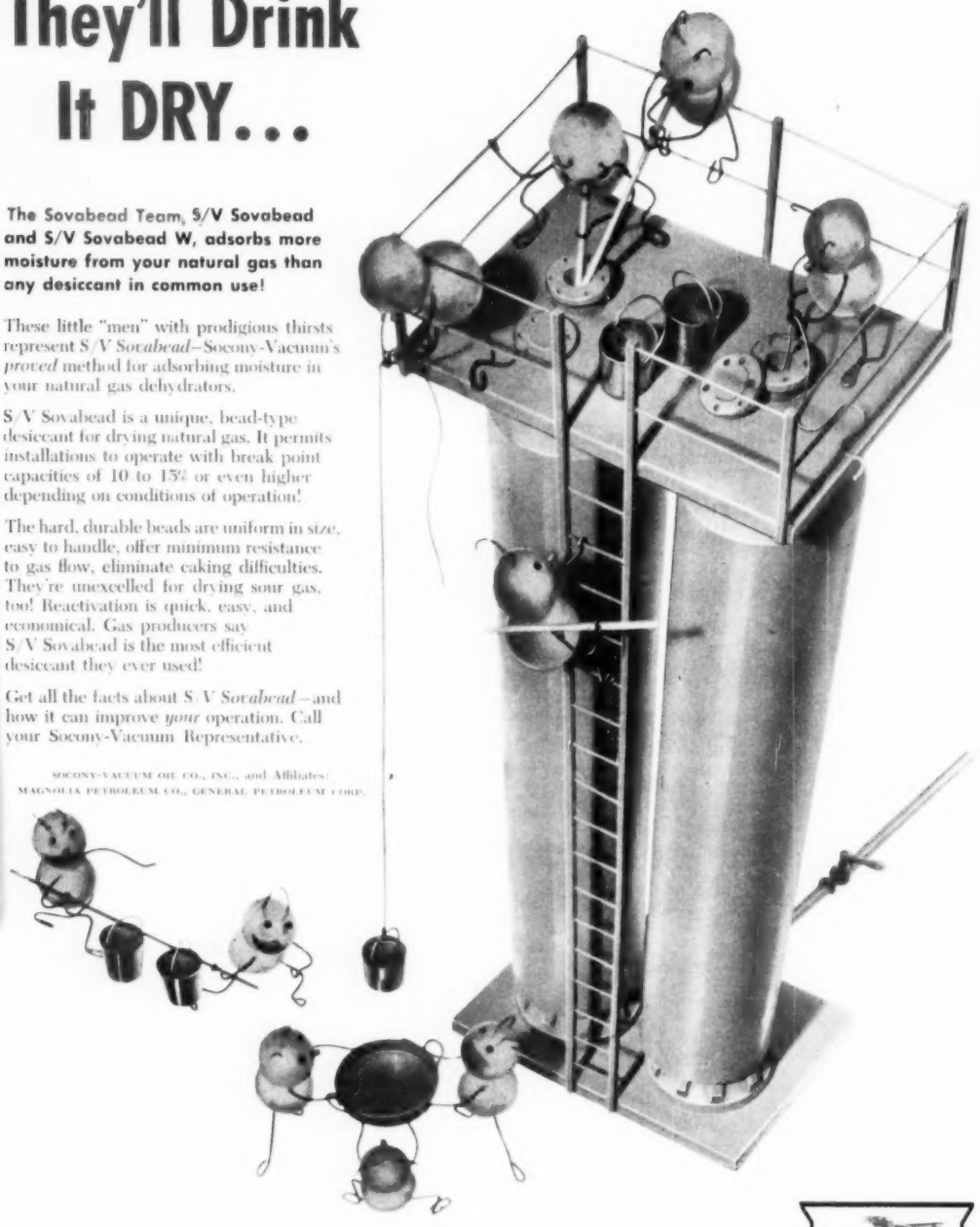


Socony-Vacuum Process Products

Process Products

Orange Juice. Actually there is no such interconnection of relationship as the chart shows. So far as Standard Oil Co. (Ind.) is concerned, our company became entirely independent, separate, and distinct in 1911 and has so operated ever since. We have no control of policies or practices of any other Standard Oil Co. nor have any of them of ours.

"Also the implication that original founders' families are a great force in current ownership of this company is manifestly incorrect. They do not have the power the chart attributes to them. This is a myth that stems from the days long past when the Rockefeller and other founders' interests were majority stockholders in Standard Oil companies.

"The situation is far different today. Our records show that for many years no institutional stockholder has owned so much as 5 per cent of the stock of our company and no individual has owned so much as 1 per cent.

"Today the relatives of the original founders of Standard Oil who own stock in this company hold only a small minority interest. . . ."

Dr. Robert E. Wilson, chairman of the board, Standard Oil Co. (Ind.), in telegram to Life Magazine.

Operating Monuments

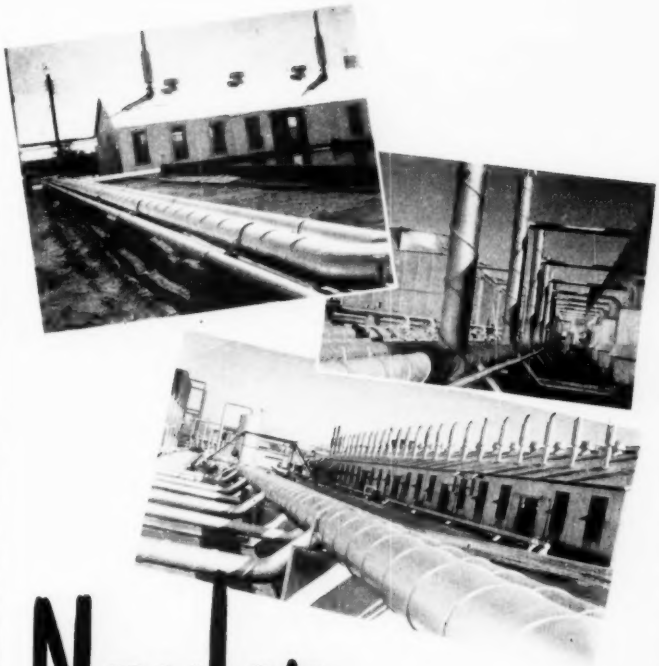
"Pressure - maintenance projects stand as monuments to the unceasing efforts of the most progressive minds of the industry to evaluate and apply their experience toward the goal of increasing the recovery of the hydrocarbon content from nature's underground reservoirs."

Report on secondary-recovery operations in Louisiana, prepared by George B. Holden and James H. Tillery, Jr., Louisiana Department of Conservation.

Transmission Miracle

"Of three million square miles surface area in this vast country, less than 20,000 cover natural-gas fields. The miracle of discovery would be of small value without a miracle of transportation—safe, rapid, and economical transportation of natural gas over many hundreds of miles of teeming cities, bustling industrial centers. A miraculous network of long-distance transmission pipe lines carries natural gas from its birthplace in 22 states to consumers in 34 states and the District of Columbia. This vast underground system now totals 251,330 miles. It is 17,000 miles longer than main railroad tracks; it exceeds the nation's oil pipe lines by 100,000 miles. Another 15,000 miles of natural-gas lines are awaiting approval by the Federal Power Commission, and may be built as rapidly as steel supplies permit. The miracle of transmission is still unfolding."

Editorial in the Tecumseh (Okla.) Standard.



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...The Lightweight Pipe for Lines in Natural Gas Service

For gas gathering systems and for pipe lines in natural gas processing service, Naylor is the outstanding lightweight pipe. Though light in weight, the exclusive Naylor structure provides greater strength and safety to meet the varying conditions found in processing operations. Sizes range from 4" to 30" in diameter and thickness from 14 to 8 gauge. Write for Catalog No. 44.

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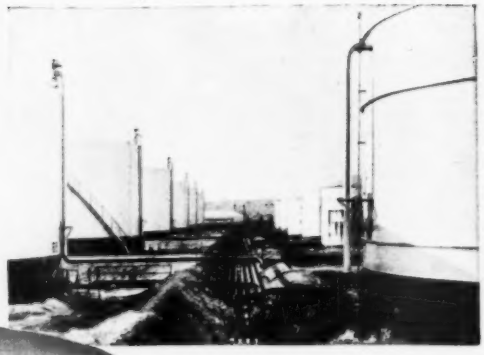

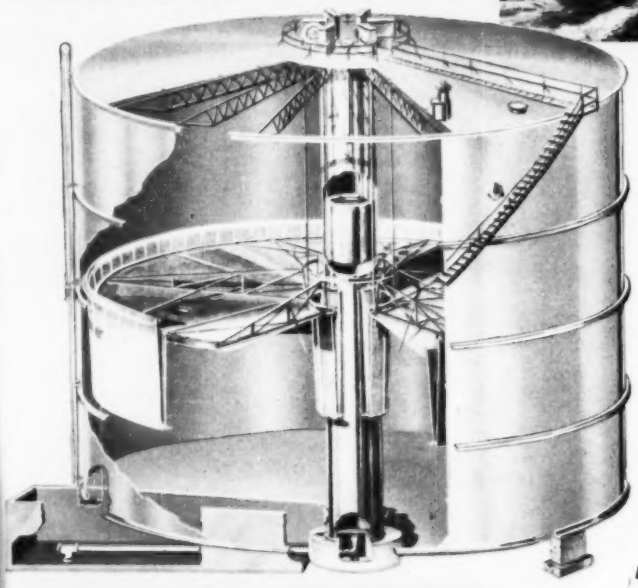

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LOW UPKEEP**

100% DRY SEAL
No wet seal corrosion problems—
no heating—no fire hazard

**VAPOR BALANCING AT
STANDARD CONE ROOF PRESSURE**

**ALL MOVING PARTS
UNDER COVER**

**EASY ACCESS FOR INSPECTION
DURING OPERATION**

THE DRY SEAL GASHOLDER VAPOR BALANCING SYSTEM

The more it works—the more you save!
One typical gasoline refinery interconnected a 150,000 cubic foot Wiggins DRY SEAL Gasholder with six 25,000 bbl. cone roof tanks. In one week, breathing and pumping losses of 5,220 gallons were saved. In less than 20 months, the whole gasholder installation was paid for (including 5% interest, depreciation, taxes, insurance, maintenance and operating). Ask for a "Pay Out Analysis" of your storage tankage without obligation. And be sure to write for Bulletin VB10, too.

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JOURNALLY Speaking

Off the Map

LOST—200 million barrels of crude reserves.

On page 47 of last week's issue was a map of Scurry County, Texas, with a big yellow blotch indicating the approximate productive area of the now famous Canyon Reef formation. On about half the copies there was another yellow blotch in the upper right-hand corner to indicate that discoveries just across the line in Kent County may mean that this same reef extends all the way up there. But half of our subscribers got maps completely devoid of Canyon Reef production in Kent.

The explanation is one of those things that happen in the best-regulated printing plants. Half way through the press run the engraving broke in two and Kent County's oil fell out on the floor. It was the middle of the night and the cut couldn't be patched, so the presses kept on rolling.

Secretary Ickes used to accuse the oil industry of "finding oil with a pencil" whenever it answered his periodic running-out-of-oil charges by "extensions and revisions" of its reserve figures. In this case we revised the process and wiped a whole county off the map by a stroke of the press.

We hope the operators won't be discouraged by this, but will keep right on making discoveries which will put Kent County back on the map to stay.

Tsk, Tsk, Oscar

THE Honorable Oscar L. Chapman, Secretary of the Interior, is a native-born Coloradoan, but recent testimony before the House appropriations committee suggests that he may have lost his perspective by too-long association with the international-minded clique in Washington.

Seeking more dough for his own geologists, the Hon. Sec. said that there had been no major discoveries of oil in the United States for a long time, but only some "minor discoveries" in Montana, Wyoming, and California—"no discovery to keep pace with the demands of oil consumers."

"I might tell you one other thing that is not confidential," he added. "There is a Canadian development of oil that you will hear more about a little later on that is very important. It has not been fully discussed in the press as of yet, but they have made a very vital, important discovery of new oil fields.

"Estimates by the geological people of the Government of Canada indicated that it is probably the largest find they have ever had anywhere on this continent."

Unless the committee stenographer misquoted him it would seem that Chapman has not been keeping very close tabs on the domestic oil situation recently. We were under the distinct impression that oil men generally were of the opinion that discoveries were just a wee bit ahead of the pace of the demands.

Of course, this testimony was presented before Chapman had the report of the NPC committee on reserves (last week's issue pages 22 and 23) which said we could produce 1,000,000 bbl. per day more than we can consume, but even so he must not have been reading our favorite oil publication.

Has he never heard of Scurry County, to mention just one recent discovery? Our own conservative estimate is that this will yield close to a billion barrels, and some say much more than that.

Two weeks ago we stated that proven domestic reserves increased 1¼ billion barrels last year. In our International Number last December we reported all Canadian reserves (including the recent Alberta discoveries) at 1,200,000,000 bbl. That doesn't exactly jibe with what Chapman told the committee.

And as for the secretary's crack about the Alberta discoveries not being fully discussed in the press—well, we do our best. Every week in our Exploration and Drilling section we have a column or two on the subject, plus special articles in other parts of the magazine every now and then.

We are forced to conclude that either Oscar knows a lot of things he's not telling or else he doesn't know a lot of things we're telling.

Henry D. Ralph

NI-RESIST...
AN ECONOMICAL METAL

for resisting Corrosion, Erosion and Metal-to-Metal Wear

NI-RESIST* is the trade name of a high nickel cast iron – one of the most economical corrosion-resistant engineering materials ever developed.

NI-RESIST, mechanically similar to gray iron, and resembling austenitic stainless steel in many characteristics, provides a unique combination of properties at moderate cost . . .

RESISTS CORROSION

NI-RESIST resists corrosive attacks of *acids, alkalies* and *salts* to a degree unmatched by any other product of the cast iron industry. In strong corrosives it has 20 to 200 times the resistance of plain iron, and 5 to 50 times the resistance in mild environments.

CURBS WEAR

NI-RESIST reduces wear and galling, because graphite particles are distributed throughout its structure, as in gray iron. From this, and its work-hardening characteristics, come the superiority of NI-RESIST castings for components in metal-to-metal wear service.

CHECKS EROSION

This superior wear-resistance . . . together with inherent resistance to corrosion . . . makes NI-RESIST an outstanding material for curbing erosion by liquids and slurries. By long, trouble-free control of erosion, NI-RESIST castings reduce maintenance costs, production tie-ups and the expense of replacements.

WITHSTANDS HEAT

Although primarily used to resist corrosion, erosion and metal-to-metal wear . . . NI-RESIST is also specified for resistance to elevated temperature effects. Castings of NI-RESIST show up to 10 times better scaling resistance, and up to 12 times better growth resistance than those of plain iron at 1300 to 1500°F.

MACHINABILITY and OTHER PROPERTIES

NI-RESIST of normal hardness machines like 200 BHN gray iron and is readily weldable.

NI-RESIST has high specific electrical resistance. Thermal expansion can be controlled, from 60 per cent higher than that of plain iron to a low approximating that of Invar.

NI-RESIST is usually lower in cost than most other corrosion-resistant alloys. It is produced by authorized foundries only, in all industrial centers of the country. NI-RESIST castings have no more limitations in size and complexity than those of any gray iron.

APPLICATIONS

Several types of NI-RESIST *are available. All provide the fundamental properties described above, and differ only in certain special characteristics to meet a variety of industrial demands.*

Applications include: Salt filter drums, oil refinery tube supports and headers, turbine nozzle rings, cylinder liners, valves and fittings, furnace rollers, textile rolls, comminuter parts, blow pit pipes, precision machine tool spindle heads, bridge, and work supports, magnet housings, sugar retorts, etc.

FULL INFORMATION

May we send you two booklets? One, entitled, "Engineering Properties and Applications of NI-RESIST," includes corrosion data on NI-RESIST and cast iron under 400 different corrosive conditions. The other, entitled, "Buyers' Guide for NI-RESIST Castings," lists producers of NI-RESIST castings. Both are yours for the asking. Write for them today.

*Reg. U. S. Pat. Off.

EMBLEM OF INCO SERVICE

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N. Y.

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DO YOU KNOW HOW "Metal Petals" BRING YOU SUCCESSFUL CEMENTING RESULTS?

In any cementing where a lower zone must be protected from contamination by the cement slurry (as well as from sloughings or cavings) the Baker METAL PETAL Basket will be found both safe and successful.

The unit is constructed of a number of individual "petals" made of flexible sheet metal. These petals are mounted on reinforcing spring steel ribs, which in turn are mounted on a ring to form the Basket.

When running in the hole, the upward pressure of the fluid tends to close the "petals" thus providing fluid passageway between the Basket and the walls of the hole, without distortion of the Basket. As soon as the casing comes to rest, upward pressure by the fluid is relieved and the petals expand to contact the walls of the hole. Any tendency of fluid to move downward then presses the flexible petals more firmly against the entire circumference of the hole. Solids strained from the fluid tend to build a bridge inside the Basket which is thus converted into a one-way packer of great strength and effectiveness.

SIMPLE, EFFECTIVE ACTION

The "Metal Petals" not only expand to contact the entire circumference of large diameter holes, but also pack-off in holes of irregular shape; and the independent action of the individually mounted overlapping petals permits successful use of the Basket in casing programs with minimum clearances.

All-metal construction and design provide ample strength; lessen the possibility of splitting or otherwise damaging the Basket while it is being run in; and the metals are unaffected by usual acids employed for various purposes.

MOUNTINGS TO MEET ALL NEEDS

Baker Metal Petal Baskets are furnished mounted on plain or perforated nipples; with or without different types of Baker Whirler Float Collars; for a wide range of cementing applications. When conditions permit, it is recommended that Baker Metal Petal Baskets be "slidably" mounted to allow rotation, spudding, or reciprocation of the casing without distorting or damaging the Basket. Maximum efficiency of Baskets is assured when a Baker Model "G" Casing Centralizer is used immediately below the Basket assembly. For details see the Baker (or Composite) Catalog; or ask any Baker representative for specific recommendations.

TOP, Baker Metal Petal Basket (Product No. 340) ready for assembly into any required cementing hook-up. The strong, spring steel ribs, each with a "metal petal" attached, expand against the wall of the hole to form a safe "one-way" packer which prevents downward movement of the cement slurry.

LOWER VIEW illustrates the overlapping "petals" (each mounted on its individual spring steel rib) thus providing flexibility and freedom of expansion to pack-off around the circumference of large-diameter holes, or holes of irregular contours. A Baker Model "G" Casing Centralizer mounted just below the Basket is recommended.

LEFT, a popular hook-up consisting of a Baker Metal Petal Basket mounted on nipple, with a Baker Cement Whirler Float Collar with Solid Baffle (Product No. 305) which causes the cement slurry to pass through the baffled, side-whirler ports.

RIGHT: Where the casing is to be rotated or reciprocated while cementing, the Metal Petal Basket is "slidably" mounted between two Stop Rings. This permits free rotation, and ample vertical movement of the casing, without distorting or damaging the Basket.

HERE'S AN EXAMPLE OF STRENGTH

The Baker Metal Petal Basket holds a record for keeping cement ABOVE and OUT OF a "zone" possessing *lower formation pressure* and *higher permeability* than is likely to be encountered in any oil well. The "zone" was an *open* coal mine stope (lateral) through which a 16-inch hole had been drilled. A Baker Metal Petal Basket, mounted on 10¾" casing (used as the surface string) successfully supported a 640-foot column of cement slurry above the stope, without breakdown or leakage. This example not only demonstrates the bridging ability of the Basket assembly, but also is evidence of the tremendous structural strength which it possesses.

BAKER
METAL PETAL BASKET
PRODUCT NO. 340

BAKER OIL TOOLS, INC.
HOUSTON • LOS ANGELES • NEW YORK

International Policy

THE most superficial observers can't escape the fact that more and more our political, economic, and social trends are dependent on world-wide conditions. Both constructive and destructive forces have an international base.

Inevitably petroleum, as the most essential commodity other than those concerned directly with the bare necessities of life, becomes a part of every issue involving world policy. The secondary-recovery operator in the Mid-Continent, the independent Gulf Coast refiner, the successful Rocky Mountain wildcatter looking for outlets, and everyone concerned with domestic oil activities now sense the fact that their present and future is tied in with what happens outside United States boundaries.

Without attempting to review the recent international oil developments which have been reported in the Journal from week to week, we feel that adequate study has been made to justify pertinent conclusions.

Sufficient oil has been found outside the United States in recent years to supply foreign requirements. Prewar the Eastern Hemisphere was about 50 per cent deficient. As production, refining, and transportation facilities expand, more outlets become the primary problem of operators.

With most foreign markets hardly more than tapped, there are vast potential demands which over a period of time can absorb existing supplies, great as they are, in an orderly manner. To accomplish this end operators must be free to do whatever has to be done to encourage oil uses.

Participation of American nationals in these outside operations is substantial and should expand. As in the past they will adapt their distribution practices to a wide variety of conditions. They will give material aid in bringing about world rehabilitation and growth, not only in supplying oil products but in distributing equitably mounting purchasing power.

But operators can't accomplish these objectives if they are circumscribed with controls, primarily political, such as are now proposed in the British sterling program. Only agreements, mutually beneficial, which promote a free flow of all trade will contribute to the solution of this problem.

It is anticipated that there will be reasonable imports from foreign sources to this country, which accounts for more than 60 per cent of the total world demand. The test as to volume of these imports is whether or not they jeopardize the continuance of a healthy domestic industry, an essential for the maintenance of a sound national economy for both normal and emergency needs.

Under present confused conditions this country conceivably could become a dumping ground for oil not needed elsewhere, a development which would be as disastrous to importing companies as it would be to those whose activities are exclusively domestic. This threat is basic in today's operations, and whatever action is needed to avoid it must be taken.

THIS WEEK

INDUSTRY—Merger of Sunray and Barnsdall companies possible through Sunray deal to acquire Floyd Odlum's controlling interest in Barnsdall. . . . ¶Railroad Commission may change method of basing Texas allowables on M.E.R. . . . ¶Move afoot to revise S.A.E. grades for lubricating oils. . . . ¶Secondary-recovery projects increasing throughout country. . . . ¶Stocks of petroleum products declared not excessive at present. . . .

DEPLETION—Treasury Department discloses detailed recommendations on oil depletion allowance as hearings open in Washington. . . . Asks maximum allowance be cut to 15 from 27½ per cent. . . . Various other changes suggested. . . . Principle of allowance to encourage oil discoveries is admitted. . . . Report suggests Treasury aims chiefly at abuse of depletion allowance as means of evading taxes on nonoil income. . . . Movie stars, ordnance companies, and other outside "wildcatters" particularly criticized. . . . Industry witnesses will be heard later. . . .

NATIONAL AFFAIRS—New natural-gas bill introduced to exempt independent producers from FPC jurisdiction. . . . Aimed at avoiding administration opposition which has defeated earlier drafts. . . . ¶Canadian oil expert says both U. S. and Dominion will benefit if petroleum permitted to cross border freely. . . . Hints at more pipe-line projects to bring Alberta crude and gas to the States. . . .

"EARS" FOR PIPE LINES.—A new wrinkle in pipe lining is this microwave radio relay communication system just installed on the Keystone line in Pennsylvania to replace a leased ground-wire system. A detailed article on the new system will appear in the engineering and operating section of next week's issue.

BRITISH BAN—Attitude of U. S. officials stiffens toward British Empire squeeze on dollar oil after disclosure of Colonial Office "token resistance" letter. . . . Washington discussions suspended again when latest British offer is termed "not acceptable" and no real concession. . . . Acheson and Connally blast restrictions on American companies. . . . Company officials feel encouraged at latest developments. . . .

ACTIVITY—Crude-oil production for the week ended February 4 averaged 4,879,050 bbl. daily, an increase of 3,185 bbl. daily over the previous week but about 480,000 bbl. daily less than the same week last year. . . . ¶Total well completions rose to 793 wells and wildcats to 156 for the week, both representing increases over last week and the same week in 1949. . . . ¶Rotary rigs operating on January 30 totaled 1,909 rigs compared with 1,947 a week earlier and 1,880 on January 31, 1949. . . .

TRENDS—Crude-oil stocks dropped below 250,000,000 bbl. on January 14 for the first time in over a year. . . . Decreases for the 2-week period ended January 28 averaged about 100,000 bbl. daily. . . . Except for the period of increased production in November, crude stocks have decreased every month since last June. . . . If refinery runs continue near the January level, moderate withdrawals from crude storage in February are expected. . . .

INTERNATIONAL—Concession terms for production operations in major areas analyzed and tabulated for quick comparison. . . . Royalties and other terms vary greatly. . . . Recent tendency is toward increased obligations. . . . ¶First oil from new Mexican discovery well now moving to refinery. . . . New company formed to drill in Mexico with foreign capital. . . . ¶First cargo of crude from Chile's new field en route to Uruguay. . . .

REFINING—Esso Standard Oil Co. dedicates new mechanical building at Baton Rouge refinery. . . . ¶Frontier Refining Co. announces plans for new storage terminal at North Platte, Neb. . . . ¶General Petroleum Corp. sets record at Torrance refinery with total of 37,475,000 bbl. of crude run during 1949. . . . ¶U. S. Bureau of Mines report discloses aviation gasoline output during first 11 months of 1949 increased 2.4 per cent over corresponding period in 1948. . . .

NATURAL GAS—El Paso Natural Gas Co. president emphasizes that purchase by that company of approximately 14,000 acres in San Juan basin leases from Delhi Oil Corp. is contingent upon FPC approval of El Paso's proposed natural-gas line from the basin to the Arizona-California border. . . . ¶Application by Tennessee Gas Transmission Co. for permit to increase line capacity in Louisiana is dismissed by FPC. . . . ¶A.G.A. appoints committee to review organization's constitution and by-laws. . . .

Sunray-Barnsdall Deal

Negotiations with Atlas Corp. for purchase of controlling interest in Midwest producing company now nearing end

Henry D. Ralph

A STOCK acquisition which might lead to the eventual merger of two of the larger Mid-Continent independent oil companies was in final stages of negotiation this week.

Sunray Oil Corp., Tulsa, is proposing to purchase controlling interest in Barnsdall Oil Co., Tulsa and New York, from Atlas Corp., an investment company headed by Floyd B. Odlum, New York and Los Angeles financial magnate.

Negotiations were conducted over the week end in Los Angeles between Odlum, Clarence H. Wright, president of Sunray, and Lloyd S. Gilmour of Eastman, Dillon & Co., New York investment company.

The deal was scheduled to be laid before directors of Atlas this week and directors of Sunray in Tulsa February 11.

Odlum controls approximately 800,000 shares of Barnsdall common stock, which is between 40 and 45 per cent of total shares outstanding. It is understood that Sunray will acquire all of this for approximately $50,000,000.

Merger talked. — No merger of the two companies is involved in the current deal, but it is reported that Sunray later may make an offer to other Barnsdall stockholders which eventually might result in consolidation of the concerns and elimination of the Barnsdall firm name from the oil industry. Barnsdall is believed to be the oldest oil company in the world still operating under the same name, having had its origin in Pennsylvania soon after the Drake discovery.

Floyd Odlum, well known in financial circles but a newcomer to the oil industry, acquired control of Barnsdall about 2 years ago, using Atlas Corp. and its subsidiary Ogden Corp. After gaining control he went on the board of directors of Barnsdall.

From time to time there have been reports that Odlum was offering his interests for sale, and last fall Continental Oil Co. was said to be interested in purchasing Barnsdall. Later Odlum announced a plan to merge Ogden and Barnsdall. Presumably this was a way to relieve Atlas of operating responsibility for Barnsdall and take Ogden out of the investment-trust business, and it was generally interpreted as indicating that Odlum would remain in the oil business. However, this deal was abandoned last November when the Treasury Department ruled that this would not be a tax-free merger.

Each company has crude production of around 30,000 bbl. per day. Both operate in Oklahoma, Texas, Kansas, Louisiana, New Mexico, and California. Each, through partnerships with other concerns, has operations in Canada. Barnsdall has no refineries but Sunray has refining capacity in excess of its own crude production. Neither company engages in jobbing or retail distribution of refined products.

Barnsdall data. — Barnsdall formerly was an integrated company but several years ago it became purely a producing company. Its refining facilities were acquired by Bareco Oil Co., Tulsa.

The 1948 annual report of Barnsdall listed total assets of $52,000,000, gross operating income of $37,000,000, and net income of $13,000,000.

The report gave total net crude production for 1948 as 11,533,000 bbl., an average of 31,500 bbl. daily. Of the total, approximately 3,000,000 bbl. came from California, 2,600,000 from Louisiana, 2,400,000 from Texas, 1,600,000 from Arkansas, 900,000 from Oklahoma, 400,000 from Kansas, and smaller amounts from New Mexico, Ohio, West Virginia, Illinois, Wyoming, Pennsylvania, and Indiana.

Barnsdall has a large natural-gasoline plant at Newhall-Potrero field, California, smaller plants at Avant and Earlsboro, Oklahoma, and substantial interests in the plants at Benton and West Tepetate, Louisiana. In 1948 Barnsdall sold 30,000,000 gal. of liquid products and 23,000,000 M.c.f. of natural gas.

The company has been active in exploration and development, and in recent months acquired a huge block in Scurry and Kent counties, Texas, from the Lew Wentz estate.

Barnsdall's 1948 report listed ownership of 1,941 net producing wells, 96,549 net productive acres, and 682,419 net undeveloped acres. It has approximately 1,400 employes.

Barnsdall's Canadian operations are conducted in partnership with Honolulu Oil Corp. and Seaboard Oil Co., and the joint venture has exploration rights on approximately 2,000,000 acres in Alberta.

Sunray data. — Sunray's 1948 report listed total assets at $136,000,000, gross operating income at $65,000,000, and net income at $15,000,000.

Its net crude production was approximately 33,700 bbl. daily in 1948 and 29,200 bbl. daily in 1949. This production came chiefly from Texas, Oklahoma, Kansas, and California, and Sunray has operations and some production in Louisiana and New Mexico.

Sunray has in excess of 1,500 net producing wells and an interest in another 1,500. At the end of 1948 it had leases on 87,541 net producing acres and 538,317 net undeveloped acres in the United States. The company has about 1,200 employes.

Sunray has a refinery at Santa Maria, Calif., with a capacity of 7,000 bbl. per day; at Duncan, Okla., with capacity of 20,000 bbl. per day; and at Allen, Okla., with capacity of 5,000 bbl. per day. The Duncan refinery was an aviation-gasoline plant purchased from the Government in 1947 and remodeled into a complete refinery. It is connected with the Allen refinery by a 98-mile pipe line.

In 1948 Sunray entered Canada and acquired interests in several Alberta operations. It owns 20 per cent of Bear Oil Co., Ltd., which has drilling rights of 4,600,000 acres; 50 per cent of Peace River Natural Gas Co., Ltd., which has 645,000 acres under lease and shut-in gas production; 10 per cent of Pacific Petroleums Ltd., an active Alberta operator; and some other interests in Canada. Sunray and associated Canadian companies are behind Westcoast Transmission Co., Ltd., which is currently seeking authorization to construct a gas pipe line to Puget Sound.

The present Sunray company was organized in 1929, taking over properties that had been developed by a previous Sunray company and associated interests. The company was merged in 1943 with Superior Oil Co. of Oklahoma. The following year the company acquired Darby Oil Co., a successful producing concern with its principal properties in Oklahoma and Kansas. In 1946 the company acquired a substantial producing operation in Texas through the purchase of the stock of Transwestern Oil Co.

The Sunray company, which is incorporated under the laws of Delaware, has a 6⅔ per cent interest in American Independent Oil Co. This concern holds a 50 per cent interest in an oil concession located in the neutral zone between Kuwait and Saudi Arabia. Drilling operations recently started there.

In 1948 the company was involved in a proposed merger with Skelly Oil Co., Mission Corp., and Pacific Western Oil Corp. This merger was dropped following legal action by minority interests of the Skelly company which with the Mission and Pacific Western is controlled by the Paul Getty interests.

Canadian Oil Outlook

Economic union between United States and Canada as far as oil, gas are concerned is proposed by Canadian oil man

CHICAGO.—The size of Alberta's future oil industry will dwarf the present scale of operations if Canada and the United States accept the idea that the two nations are a "single, great economic unit."

That was the keynote of an address by Carl O. Nickle, well-known Calgary oil writer and independent oil man, before the Stock Brokers' Associates of Chicago this week.

Nickle said that during the next decade probably more than one billion dollars will be needed for the expanding Canadian oil and gas industry. "These moneys will be needed, subject to certain conditions: (1) Further discoveries, which are highly probable; (2) expansion of markets for the oil and gas, also highly probable; and (3) continuance of favorable political weather and tax regulations, both in Canada and the United States."

After discussing some of the background of the oil exploration in Alberta, and explaining how the present potential production far exceeded the local prairie province market demand, the speaker said: "As a matter of fact, within a few months after the Leduc discovery in 1947, the discoverer of that field started planning for the means of reaching markets beyond the Prairies.

"The first phase of that planning is the Interprovincial pipe line. That line will cost $90,000,000 for an oil-hauling capacity of 95,000 bbl. daily from Edmonton to Regina, and capacity of 70,000 bbl. from Regina to Superior, Wis. A somewhat smaller dollar spending could—when the time is ripe—at least double the transport capacity.

"Official announcements by the pipe-line sponsors so far are concerned only with the use to which the line will be put in supplying the prairie provinces and part of the Ontario market. Bear in mind, however, that an oil pipe-line is in some respects a flexible operation. Oil carrying capacity can be increased by addition of more pumping stations and by adding loops to the line. Throughput can be increased also by adding storage facilities at the outer terminus that would permit year-around operation of the line at maximum rate. These steps will be warranted with Interprovincial, if a larger market is made available."

Markets.—Discussing some of the potential larger markets, Nickle said: "Getting Alberta oil into Sarnia and Petrolia (Ontario refining centers) means tapping only a quarter of Canada's mass eastern market, which requires well over 200,000 bbl. daily. It is a 650-mile tanker haul from the Superior pipe-line terminus to Sarnia. About 200 miles more would get Alberta oil to Toronto, while 600 miles more would take it to Montreal.

"The whole market could be served from Alberta, if politics dictate, by displacing the American and other foreign oils now serving Canada's East. Such action would not be economic, however, nor would it be in the best long-term interests of Canada and the United States." *(Editor's note—Eastern Canada imports about one-third of its petroleum requirements from the United States, about two-thirds from South America and Trinidad).*

Speaking of potential United States marketing areas, the speaker said: "The Interprovincial pipe line passes from Manitoba into North Dakota, Minnesota, and Wisconsin, reaching close to a great Midwest United States area which consumes more petroleum than the whole of Canada. Minneapolis and St. Paul are only 135 miles overland from the Superior pipe-line terminus. Chicago is only 400 miles away by land, and is closer by water than Toronto. Further east, south of Sarnia and closer to that city than Toronto, are Detroit, Toledo, and Cleveland.

"If economics is to be the deciding factor in markets for oil, the Interprovincial pipe line will grow from initial stages into maturity by tapping, for Alberta crude, part of the great midwestern United States market. Eastern Canada would then continue to get its oil from existing sources in the United States and elsewhere."

Prices.—Nickle stated that Alberta crude-oil prices at the well would have to be reduced from their present level to reach broader markets. Discussing a specific instance, he said:

"To beat down the economic barriers to broader markets—in this case the Sarnia area of Ontario—the delivered price of Alberta oil must be brought down to the competitive level with oil from other nations at the far fringe of the market. Lowered transport cost alone won't permit Alberta oil to compete at Sarnia.

"Prices for crude at Alberta well heads must also be scaled down, probably on the order of 75 cents per barrel for a light oil such as Leduc's, which now fetches $3.20 a barrel in the field. Looking further into the future, to broader markets and world price levels, many Alberta oil men are figuring '2-dollar oil' as the probable average for the province's light-crude fields, on the long-term basis."

Pipe lines.—The speaker also revealed that active planning is under way for an oil pipe line to the Pacific Coast, in the expectation that Alberta oil reserves will climb beyond the two-billion-barrel mark within a year or two.

"Such a line would serve the Vancouver refineries in British Columbia, but would not be economically feasible unless it could also serve the United States Pacific Northwest. The proposed $100,000,000 pipe line over the Rockies would have to be fitted in with a large refinery-expansion program in Oregon and Washington."

Gas pipe lines out of Alberta will also have to depend on markets in the United States, according to Nickle. He stated "Important to note is that gas export either east or west would not be economic, considering the high capital cost of pipe-line construction, if only Canadian markets could be served."

Sun's Answer

Company tells court charges of Government unfounded

PHILADELPHIA.—Sun Oil Co. told the federal district court here last week that the Department of Justice complaint, filed early last month, is based in part on practices long since abandoned.

In a formal answer to the complaint, Sun declared that while at one time it did have the exclusive contracts with filling stations charged by the Government, they were abandoned as far back as 1937 in favor of non-exclusive contracts. The previously prevalent industry practice of assessing a one-half cent differential on gasoline to dealers selling the product of more than one supplier was abandoned in May, 1949, it said.

The position attained by Sun in its 18-state territory, it was contended, is the result of a "vigorous policy of aggressive competition" and not of policies of suppressing competition.

The company placed its total of service stations supplied at 6,573 and not the 10,000 alleged by the Department of Justice, and filed copies of its contracts with the court, saying "the written leases and contracts speak for themselves."

"Defendant (Sun) denies that supplementary agreements, written or oral, have in any case been entered into by the defendant or, with its knowledge, by any person authorized to bind it," the answer added.

The use of supply contracts which set minimum and maximum amounts of products a dealer can buy is a common business practice, Sun said, explaining they are necessary so a seller may know his total commitments and the buyer be reasonably assured of a minimum supply for the period under contract.

The company freely admitted that

its gasoline has received "steadily increasing public acceptance" since it entered the market on a serious scale in 1927, but refused to hazard any guesses as to why customers patronize a particular station, saying the reasons include convenience of location, preferences as to the brand, type, or quality of product they desire, etc.

In conclusion, the company asserted the charges of misconduct made in the complaint are "baseless in fact and unsupported by law" and asked that the action be dismissed.

New Canadian Company

WASHINGTON.—Formation in Canada of Dome Exploration (Western), Ltd., to be financed in this country to explore for and develop oil and natural gas in Western Canada, was disclosed last week in a registration statement filed with the Securities and Exchange Commission.

The company was organized in Toronto last month with James G. McCrea, general manager of Sigma Mines (Quebec), Ltd., a subsidiary of Dome Mines, Ltd., as president. Other promoters of the company are listed as Henry Brunie, president of Empire Trust Co., New York; Clifford W. Michel, partner in Carl M. Loeb, Rhoades & Co., New York; and William F. Morton, vice president of State Street Investment Corp., Boston.

The company proposes to issue $10,000,000 of 10-year notes and 249,993 shares of $1-par capital stock. The registration statement reported that Dome Mines., Ltd., will purchase $2,500,000 of the notes and 62,493 shares of stock; Surplus Assets Corp., wholly owned subsidiary of Empire Trust Co., will purchase 18,750 shares of stock; and the remaining $7,500,000 of notes and 168,750 shares of stock will be offered to a limited number, not exceeding 15, of corporations, groups, and individuals selected by the company.

It was explained that the company owns no oil or gas properties but proposes to bid at the public auctions conducted by the provinces of Alberta and Saskatchewan for so-called Crown leases.

ECONOMICS

Report on Stocks

There's little change in total stocks, compared with 1949, but individual products reveal shifts in prices, markets

John C. Casper

TOTAL stocks of gasoline, kerosine, distillate, and residual on January 28 were only 3,600,000 bbl. greater than at the end of January last year, and yet the distribution of the stock changes by products and districts has resulted in some distinct shifts in product prices and markets.

Refinery production of gasoline in the 4-week period ended January 28 was 2,624,000 bbl. daily, an increase of 3.2 per cent over the average for January 1949, despite a decrease in refinery runs amounting to 2.7 per cent. Additions to gasoline stocks were 40,000 bbl. daily less than in January last year resulting in a gain of 5.8 per cent in indicated refinery demand.

The high level of gasoline inventories is due to the larger carryover at the end of the summer and not to abnormal accumulations during the winter period to date. Increases in storage for the first 4 weeks of the year have been evenly distributed among all districts.

California, with 16 per cent of gasoline stocks, accounted for 14 per cent of the stock increase. However, the West Coast gain since the end of January 1949 amounts to 76 per cent of the total increase for the country. Gasoline stocks east of California are only 1,800,000 bbl. greater than at the end of January last year.

In the first 4 weeks of this year, all product stock changes in California have followed the trend for the country as a whole, but the heavy additions to storage on the West Coast throughout most of 1949 tend to distort comparisons of current stocks with those of early 1949.

Total distillate stocks are only about 4,600,000 bbl. higher than at the end of January last year with about 85 per cent of the gain in California. However, West Coast withdrawals for the 4-week period in January were proportionate to decreases for the country as a whole.

Total distillate stocks in all areas east of California have increased less than 700,000 bbl. since January 31, 1949, but the changes by areas reflect the wide variations from the normal pattern of heating-oil demand. Gulf-East Coast stocks are up about 2,600,000 bbl., while stocks in the Mid-Continent and North Central districts are down 1,600,000 bbl.

Since stock change is the balancing factor between supply and demand, these differences by areas tend to show the abnormal changes in demand.

Gulf-East Coast production of distillate in the first 4 weeks of this year averaged 2.2 per cent less than in January last year. Stock decreases averaged 153,000 bbl. daily compared with 150,000 bbl. daily in the earlier period. Indicated refinery demand was down 1.2 per cent.

In the past it has been a marketing policy to move fuels to storage near the point of consumption. This policy was followed in January as distillate stocks on the Gulf Coast dropped 3,700,000 bbl. compared with a decrease of only 615,000 bbl. on the East Coast.

Slow distillate sales and small stock reductions have produced a soft distillate market on the East Coast. The New York Harbor "low" for No. 2 fuel dropped 0.6 cent between December 27 and January 30.

Refinery production of distillate in Mid-Continent and North Central districts averaged 252,000 bbl. daily in the first 4 weeks of January compared with a daily average of 234,000 bbl. in January 1949, an increase of 7.7 per cent. However, this increase was not enough to cover requirements. Stock withdrawals had to be increased 69 per cent in order to meet the 24 per cent gain in refinery demand.

Group 3 prices have reflected this increase in distillate sales. The "low" for No. 2 fuel rose from 7 cents a gallon on December 27 to 7⅝ cents on January 30. Some suppliers feel that the firm Mid-Continent market may have a stabilizing influence on distillate prices in the Gulf Coast.

DISTILLATE STOCKS
(Thousands of barrels)

	[a]Jan. 28, 1950	[a]Dec. 31, 1949	[b]Jan. 30, 1949	Change from Dec. 31	Change from Jan. 30
East Coast	23,115	23,730	21,917	— 615	+ 1,198
Appalachian:					
District 1	746	846	780	— 100	— 34
District 2	213	226	255	— 13	— 42
Ind., Ill., Ky.	8,348	11,011	9,730	— 2,663	— 1,382
Okla., Kans., Mo.	4,085	5,452	4,311	— 1,367	— 226
Inland Texas	757	985	714	— 228	+ 43
Texas Gulf Coast	12,083	14,941	11,026	— 2,858	+ 1,057
La. Gulf Coast	3,712	4,535	3,375	— 823	+ 337
N. La. and Ark.	499	647	798	— 148	— 299
Rocky Mountain:					
New Mexico	80	74	94	+ 6	— 14
Other Rocky Mountain	1,352	1,823	1,302	— 471	+ 50
California	11,347	13,531	7,427	— 2,184	+ 3,920
United States	66,337	77,801	61,729	— 11,464	+ 4,608

[a]A.P.I. Weekly. [b]Bureau of Mines.

British-Ban Deadlock

Latest British offer contains no real concessions; talks suspended for study as U. S. officials stiffen attitudes

Bertram F. Linz

WASHINGTON. — Anglo-American oil talks resumed here last week with no indication that Britain is prepared to modify in any material manner the order designed to substitute sterling oil for dollar fuel oil and gasoline throughout the sterling area.

British negotiators who returned to Washington after discussions with their government in London came armed with proposals which, in the final analysis, it was reported, made no concessions which recognized the protests by our State Department.

The British offer to permit the American companies to retain so much of their business as the British-controlled companies were unable to take over was phrased in terms which made quick analysis impossible. After one session the talks were suspended while American experts made a study of the proposals.

There were no indications at the week end as to when the joint talks might be resumed, but some observers expressed the belief the conversations would get nowhere by February 15, the date now fixed on which the British order will take effect, influencing the British Government to again postpone it.

New proposals.—At the best, it was said, the British proposals provided merely that the embargo on dollar oil would not be extended during the remaining life of the Marshall plan, provided that ECA funds continued to flow to Britain without interruption and without restriction.

There was also some suggestion that the British would relax gasoline rationing slightly and give the American companies a limited share of the larger market thus opened up, but this was more than offset by an announcement that the British would reserve the right to specify what products the American companies might sell in the sterling area and dictate the manner in which the companies should operate.

Under this last point, the British industry, which is planning to increase lubricating-oil production by some 2,000,000 bbl. a year over 1948, would be able to reduce markets for the most important specialty this country exports and force the companies to further reliance upon the cheaper products.

There is also a threat that the British might go into aviation gasoline production, although this appeared to have been lifted recently when it was announced that plans for construction of a catalytic cracking unit at the Shell Haven refinery was shelved, but there is no assurance the plan will not be revived at any time.

The effect of the British order, issued in December, will be to cut the sales of American companies in the sterling areas from 13,000,000 to 9,000,000 tons of oil annually, and the British, it is reported, offered not to go beyond that figure before June 30, 1952, provided they can continue to draw dollars from this country under the Marshall plan. That 4,000,000-ton cut, it is pointed out, represents all that the British-controlled companies will be able to handle.

In brief, it was said in authoritative circles, the British proposals represent no change from the original plan. They definitely are not considered acceptable.

Reaction to letter.—Publication here of what is now known as the Nairobi letter, in which Colonial Secretary Arthur Creech Jones said the United States had been informed of the proposed curb on dollar oil and "as expected" contented itself with "expressing regret," brought quick and sharp reaction in administration circles.

An immediate effect was a sharp stiffening of State Department officials, and observers predicted that when the talks are resumed it will be on a "gloves off" basis which will leave no doubt that the United States will fight vigorously for a more equitable distribution of world oil trade.

Acheson statement.—At the State Department, Sec. Dean Acheson charged that the letter did not "accurately reflect the serious concern with which the United States Government viewed and continues to view the British action . . . and the manner in which the action was put into effect.

"Nor does it reflect what was stated to the British at the time it was learned that the action was to be taken," he added.

"It was and is the United States view that the British action was taken without adequate consultation with American companies to determine whether or not these companies could effect approximately equivalent dollar savings by adjustments in their operations," Acheson explained. "The British were so informed. They were also informed that even if it were found that equivalent dollar savings could not be realized by adjustments in the operations of United States companies, such displacement should only take place gradually and in a manner that would enable the United States companies to adjust with minimum hardship to the new situation."

As a result of those representations, the secretary pointed out, the British Government extended the effective date of the order from January 1 to February 15.

The various aspects of the problem are still under active discussion, Acheson said, and "it is our view that measures can be adopted which will meet the necessity of the U. K. and sterling area to save dollars on oil account and at the same time protect the legitimate interests of the countries and companies concerned."

Connally view.—At the Capitol, Sen. Tom Connally of Texas, chairman of the foreign relations committee, denominated the order "a British act of hostility to our economy" which is "most remarkable" at a time when the United States is making "stupendous gifts to Britain to rebuild her economy," and predicted the Government will take appropriate action.

The colonial secretary's letter, which was dated December 17 and sent out prior to announcement of the order, disclosed that the British companies are not expected to have any appreciable surpluses during the life of the Marshall plan of products other than fuel oil, of which, he said, "there will be more than enough available from British controlled companies' production in 1950 to take the place of all dollar imports of fuel oil for inland consumption in the Commonwealth."

What the letter did not say, and the British have not emphasized, is that the current refinery-expansion program in the not distant future may put England in a position to take over the American lubricating-oil trade as well as its fuel-oil business.

British background. — The dollar-exchange problem which the British contend is the basis for their efforts to substitute sterling for dollar oil wherever they have any control, is not a new development resulting only from the last war.

Actually it had its inception as far back as the first World War and was intensified during the depression 20 years ago. Traditionally, England bought more from us that she sold to us but the dollar income received from British investments in the United States, American tourists and other "invisible" items served to keep

her more or less on an even keel. Some of her American investments were sold during the first war, more during the depression, and most of what remained during the last war. Wars and depression cut down the tourist trade, dollar revenues from shipping, insurance and other services fell off, and the dollar deficit mounted at an alarming rate.

Meanwhile, other developments also were pressing upon England. Until the outbreak of the last war, her one big export was coal which moved to the East, to European countries and as far as Egypt. This coal enabled her to buy food and other neccessities, some machinery and equipment and to some extent helped minimize the dollar problem, although it is claimed it has been difficult for years to get the dollars to buy United States and Venezuelan oil.

The westward spread of communism has narrowed England's coal markets and many of those which were left have switched a large part of their fuel demand to oil. Consequently, England is understood to have argued in the oil talks that it is necessary for her to have a substitute for coal. And that substitute must be sold in dollar markets to get the exchange to purchase machinery and other commodities necessary if she is to get on her feet and out from under the ECA dole. And oil is the only commodity that meets these specifications.

Oil industry view.—There has been talk by some in the industry that the situation might develop an international price war, which undeniably would put the British in a hole. There also has been some talk that ECA quit financing both British oil purchases and refinery construction, or drop oil entirely from the commodities it finances for the Marshall Plan countries. Either of those might start a general free-for-all fight for world markets.

Some in the industry also believe that if the British exchange controls were lifted the companies could work out arrangements with each market individually—a solution recommended by the United States in a statement of proposed principles submitted to the British last year. Given freedom to use sterling and other currencies, they would not need 100 per cent convertibility of local currencies into dollars, for a large part of their foreign operations could be paid for with sterling or other funds.

Given what they consider a fair solution of the British problem, the companies believe the threat of heavy imports into the United States would be lifted and, in view of the rising furor for control of imports, they probably would make arrangements quickly to control the flow of oil into this country.

Firm Embargo Stand

Talk of an all-out trade war fades, hopes for compromise brighten with Government support of industry's position

Dahl M. Duff

NEW YORK.—Publication of the British Government's letter to the East Africa Government, the statement of Senator Connally, and the position of Secretary of State Acheson all appear to have strengthened the stand of the American oil companies in their resistance to the new British policy of replacing dollar-produced oil in sterling-area markets.

Discussions on the dollar-sterling oil problem were continuing in Washington at the government level, and it was believed the matter will come to a head in the near future. The British plan under which dollar fuel-oil imports will be eliminated from the United Kingdom market and motor fuel cut one-third is now scheduled to take effect next week on February 15. The original effective date of January 1 was set back a month and a half.

U. S. industry's position.—Since the British policy of substituting surplus sterling oil for U.K. dollar-oil imports was announced in mid-December, officials of the affected American companies have in general held that only a firm stand by the United States Government could adequately protect their legitimate trading interests and bring about some compromise arrangement acceptable to both sides.

The events of last week pointed to a more favorable attitude of government officials in Washington. Disclosure *(The Oil and Gas Journal, February 2, page 26)* of a confidential letter sent by the British Colonial Office to the East African Government declaring the U. S. State Department had only expressed "regret" at the British import policy was followed within 2 days by the Acheson and Connally statements. Secretary Acheson, who is regarded by the oil industry as warmly sympathetic to the British, said this Government views the British action with "serious concern." Senator Connally, a key figure in Marshall-plan appropriations, termed the move "an act of hostility to our economy."

In industry circles there was still some talk of the possibility of an all-out trade war with British oil, together with such measures as price cuts and acceptance of local currencies. This, however, appeared to be overshadowed by the Washington negotiations toward a compromise.

Just what form this compromise will eventually take, if it is worked out, was impossible to say. There were numerous reports on proposals and counterproposals that have been made, but a lack of any official information.

Compromises suggested.—All of them are based on some degree of "sterlingization" of foreign operations of several large American oil companies, principally California-Texas Oil Co., Ltd.; Standard Oil Co. (N. J.), and Socony-Vacuum Oil Co., Ltd. It has been emphasized that the individual problems of these companies are all different since their interests in each market and monetary area vary widely.

Whether British Government officials are actually in favor of a sterling basis for the American oil companies has been doubted. Such a program if carried over into other industries could have far-reaching effects on the British economy.

One report was that the British officials had offered to make possible the sale elsewhere for sterling of the dollar-produced oil backed out of the United Kingdom and the rest of the sterling area by the substitution policy. The sterling thus acquired would be strictly limited in its use.

Another plan said to have been offered involved allowances by the British of 33 per cent of operating expenses in dollars for purchases in the United States, a limitation on dollar-converted profits to 6 per cent, and establishment of subsidiary companies in the United Kingdom subject to British financial control and regulation.

Standard Oil Co. (N. J.) was reported to have presented a new proposal to the British Government under which it would organize a British corporation subject to United Kingdom taxation to handle its distribution operations in the areas affected by the sterling currency problem. The British would convert 50 per cent of the sales proceeds after taxes into dollars. This company would buy oil from producing affiliates in Latin America and the Persian Gulf at prices below the going market.

British reaction.—While these efforts toward a compromise solution were being made in Washington, the British reaction to the latest developments as shown by reports from London generally was one of surprise since Britain has been urged by American officials since the war to take every means to save dollars. This was the purpose, British officials

said, of substituting sterling oil for dollar oil in the United Kingdom and suggesting that other parts of the sterling area do likewise.

Officials in London said there was no mystery about the letter to the East African Government. It has long been known that the British Government has asked other Commonwealth and sterling-area countries to make similar dollar savings. However, it also was said that the language used was "unfortunate."

A British source last week said that the United States would probably have taken the same course were it facing bankruptcy.

Bilateral trade agreements such as that last year with Argentina he defended on grounds that it was the only way that Great Britain could obtain the food and other products it needs. He said the whole problem rises above oil and no general solution is possible until the over-all world trade and currency problems are solved. The United States must buy more from abroad if it expects to sell its products for dollars in foreign markets.

In Venezuela, both industry and government officials were following the situation closely. Any plan worked out in Washington is bound to affect the markets for Venezuelan oil. Venezuela is in fact taking the brunt of the substitution policy. Leaders in Venezuela are concerned not only with the sterling-area restrictions but also with the current drive in Congress for limitation on foreign oil imports into the United States.

Depletion Dickering

Snyder proposes cut in allowance from 27½ to 15 per cent, 4 per cent increase in corporate tax rate, other changes

Bertram F. Linz

WASHINGTON.—Reduction of the depletion allowance for oil and gas from 27½ to 15 per cent and the deduction from income of intangible drilling and development costs of operators who elect to deduct them as expenses in the year incurred was proposed to the House ways and means committee by the administration last week at the opening of hearings on tax revision.

The proposal was one of a number offered by Secretary of the Treasury John Snyder to carry out the program outlined by President Truman in his tax message last month.

Snyder also called for an increase from 38 to 42 per cent in the corporate tax rate, with elimination of the present "notch" provision under which a rate of 53 per cent is applied to corporations with incomes between $25,000 and $50,000, and revision of the law with respect to foreign operations.

The secretary told the House committee that the estimated loss of revenue from the depletion allowance runs between $400,000,000 and $500,000,000 a year, and that the combination of percentage depletion and the expensing of development costs "provides a mechanism for pyramiding extensive holdings in oil assets with payment of little or no income tax."

He submitted an exhibit showing how "millions of dollars are made annually from operating oil properties on which little or no income tax is paid," citing annual incomes of over $1,000,000 on which an average tax of only 22½ per cent was paid, the rate now paid by persons with incomes of less than $25,000.

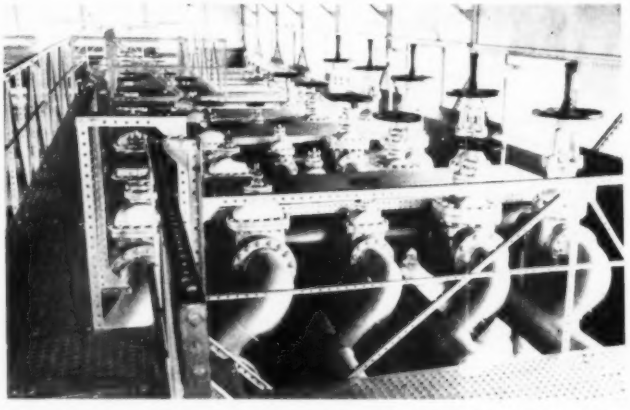
Snyder's view.—"The allowance is especially excessive in the case of oil and gas and exempts a higher proportion of the earnings of this industry which may expense more of its development costs than the other mineral industries," Snyder said in discussing depletion generally.

"Depletion in ordinary accounting usage is intended to permit taxpayers to recover the cost of mineral properties over the producing life of the properties," the secretary explained. "Depletion is the counterpart of depreciation which is intended to permit recovery of the cost of other assets over the period of their useful life. When the original investment has been recovered, no further depreciation is allowed for tax purposes. However, in the case of depletion, special provisions which allow recovery of more than the cost of mineral properties have been in the law since 1918.

"Percentage depletion continues for the life of the property and generally results in the tax-free recovery of many times the cost. It is granted to those purchasing properties as well as to those operating properties they have developed. The allowances have become more valuable as tax rates have been increased.

"Furthermore, the benefits from percentage depletion are increased by provisions which permit development costs to be deducted as an expense in the year incurred instead of being treated as a capital cost to be recovered later through depletion deductions. This is equivalent to a double deduction for the same costs, once when they are incurred and again under percentage depletion. In the oil industry during 1946 and 1947, for every $3,000,000 allowed as percentage depletion, another $2,000,000 was deducted as development costs."

Remedies proposed.—There are a number of ways in which revision of present allowances can be accomplished, Snyder said. A "reasonable" way to reduce excessive benefits would be to limit the percentage of gross income which might be deducted as depletion, but this would



Manifold at Casper, Wyo., pump station of Stanolind Pipe Line Co. which handles five segregated grades of crude oil received through an 8-in. line from Salt Creek and Taylor-Sussex fields and two 12-in. lines from the Elk Basin and Lost Cabin areas of the Stanolind system as well as Wertz and Rangely crudes from a line of Sinclair Refining Co. Oil is pumped to tanks at the Casper refineries of The Texas Co., Socony-Vacuum Oil Co., Inc., and Standard Oil Co. (Ind.) as well as the Stanolind system connecting with the company's big-inch trunk system at Freeman, Mo. At the Casper station, Stanolind is installing recording gravitometers to facilitate making sharper cuts in batching operations.

leave the more excessive allowances untouched while reducing the benefits on the small, less profitable properties.

The reduction of percentage depletion, on the other hand, would tend to reduce windfalls while protecting incentives for exploration, and his recommendations for a 15 per cent rate and the reduction of income from the property by the amount of expensed costs in computing the depletion allowance, he said, would reduce the extent of the double deductions now enjoyed by oil and gas enterprises with respect to certain of their capital costs, and together "would remove the more obvious inequities of the present system without interfering significantly with production incentives."

An exhibit prepared by the Treasury staff set forth that 90 per cent of an oil operator's capital outlay, exclusive of depreciable items, may be for intangible drilling and development costs, and if this is deducted as a current expense "and thus recovered tax free at the outset," only 10 per cent of the investment remains to be recovered through depletion allowances.

"Hence," it was argued, "depletion allowances based on the entire income in effect overlap the initial deduction of a large portion of the capital outlays."

Staff survey.—A survey of 350 corporation returns in the industries enjoying depletion allowances showed that their allowable depletion deductions amounted to $555,000,000 in 1946 and $839,000,000 in 1947. Corporations are estimated to account for more than 50 per cent of all depletion deductions.

The exhibit emphasized that the oil industry got more from depletion than the other industries which have depletion allowances. A high proportion of the excess of percentage depletion over cost or basis depletion was received by crude-oil and natural-gas producers and petroleum manufacturers. A table showed that 66 producing corporations had allowable depletion of $110,500,000 in 1947 and 45 petroleum and coal-products manufacturers, mostly oil, had $538,700,000. The excess over basis depletion was $100,200,000 for the former and $509,000,000 for the latter, 98.8 and 91.9 per cent, respectively.

The relative importance of special depletion allowances for different types of mineral producers was also presented in a table showing that all the corporations included in the survey had depletion deductions equal to about 40 per cent of their net income before depletion in the years 1946-47 while, by contrast, the amount of basis depletion required to recover remaining costs ratably over the useful economic life was only 6 per cent of net income in 1946 and 3.6 per cent in 1947. Depletion allowances in 1946 amounted to 49 per cent of net income in the case of oil and gas compared with 1½ per cent for nonmetallic products not entitled to percentage depletion.

Three-fourths of the total depletion allowances and of the excess of percentage over basis depletion was received by corporations with assets of at least $100,000,000, the Treasury said.

The staff report also gave illustrations of the effect of depletion and related allowances on the tax liabilities of individuals, showing that during the 5-year period 1943-47, 10 individuals received a total economic net income of $52,600,000 from oil and gas properties, computed after all deductions for operating expenses, depreciation, basis depletion, exploration costs, and losses on unsuccessful ventures, and also received a total of $9,300,000 of net income from other sources, while of their aggregate net income from all sources, totaling $61,900,000, 77 per cent was eliminated for tax purposes through the special deductions.

As the committee opened its hearings it planned to concentrate on loopholes in the tax laws and reduction of excise taxes, with the hope of sending legislation to the floor early next month. The Treasury did not recommend any change in the present taxes on gasoline and lubricating oils, but did call for the elimination of the levy on transportation of property and lower rates on the transportation of persons and long-distance telephone and telegraph messages.

The committee's idea of disposing first of these two phases of the President's tax program raised the possibility that action on his recommendation for an increase in corporation tax rates will be deferred and possibly not considered at all in this session of Congress.

Industry plans.—Strong opposition to any tinkering with the depletion allowance will be offered by oil industry spokesmen when they are given an opportunity to appear before the committee.

Representatives of a number of oil associations will meet in Washington February 15 at the call of the general depletion committee recently set up with Frank M. Porter, president of the Mid-Continent Oil and Gas Association, and Russell B. Brown, general counsel of the Independent Petroleum Association of America, as co-chairmen. If time permits, plans will be made at that meeting for the industry's presentation, but if the hearings reach oil depletion earlier a more informal arrangement will be made between the various groups for the submission of testimony.

Movie actors.—While it is not believed there is any real demand among members of Congress for elimination of the depletion allowance, there is a belief in some congressional circles that it should be limited to the oil industry and not, as Rep. Walter A. Lynch of New York told the House last week, remain available as a means of tax avoidance "to movie actors, manufacturers engaged in business unrelated to the oil industry, and private investing interests."

"It is a notorious fact that during the war years, ordnance companies, paint companies, and almost every other kind of manufacturing company recklessly speculated in the oil industry with excess-profits dollars," Lynch declared. "Their operations were notoriously unsuccessful and . . . the new oil reserves which they developed were inconsequential.

"It is an equally notorious fact that private investing interests and wealthy individuals are using these special benefits, designed to encourage the oil industry itself to the maximum development of oil reserves, to offset their large incomes from other sources and thus avoid the payment of income taxes which would otherwise be payable by them on such unrelated incomes.

"This was not the intended purpose of these special tax benefits and represents an illegitimate use of them."

New Gas Bill

Legislation would cut FPC control over independents

WASHINGTON. — New legislation dealing with the exemption of independent producers and gatherers of natural gas from Federal Power Commission regulation was introduced in the Senate last week by Sens. Robert S. Kerr and Elmer Thomas of Oklahoma.

This bill would substitute for the one approved last year by the Senate Interstate Commerce Committee.

The revised measure carries the provision for exemption of producers and gatherers as in the original bill but eliminates all reference to local distribution, which the Supreme Court held last month was under FPC jurisdiction *(The Oil and Gas Journal, January 22, page 33)*.

The local-distribution situation, however, would be dealt with under another bill, introduced by Sen. William Langer of North Dakota, providing that the term "natural gas company" as used in the Natural Gas Act shall mean "a person engaged in the transportation of natural gas in interstate commerce, or in the sale in interstate commerce of such gas for resale, but does not include any such person all of whose operations are conducted within the same state."

Provisions.—The new Kerr-Thomas

WATCHING WASHINGTON

Bertram F. Linz

Lube Loss Looms

American lubricants may be the next victim of the British campaign to keep dollar oil products out of the sterling area and make Europe self-sufficient in petroleum.

Officials in Washington see considerable significance in European plans to expand facilities to produce lubes by 6,000 bbl. daily, of which 4,000 bbl. would be in France and 1,000 bbl. each in Britain and Italy.

Against the millions and billions in which the oil industry speaks of production, 6,000 bbl. daily doesn't seem to be very important, but loss of that amount daily will run into millions of dollars a year. It will bring European production up to slightly more than 500,000 tons a year and enable her to reduce her imports from the dollar area from 50 per cent of her needs to 10 or 20 per cent. With the demand for lubricants not keeping pace with the increase in demand for other products in this country, the curtailment of exports now in view assumes even more serious proportions.

There is no assurance that Europe will not make further increases in lubricating-oil production which would put England in a position to export to outside markets. And, since the latest British proposals in the controversy over her fuel oil order definitely reserve to her the right to specify what products the American companies may sell in the sterling area, the whole thing adds up to something to think about.

Smog Huddle

A government drive against the problem of smog will be launched in Washington in May with a conference of an interdepartmental committee which has been set up by Interior Secretary Oscar L. Chapman at the direction of President Truman.

The 3-day meeting will discuss all phases of the problem, which has become one of the most serious facing the industrial centers of the country in recent years. Out of these talks, the committee hopes to come up with specific recommendations, but it is not likely that any suggestions will be made for national legislation prohibiting air pollution, which most authorities believe is a field for action by the states.

Although smog has long plagued industrial centers, it did not assume the stature of a national problem until a severe attack at Donora, Pa., caused a number of deaths 2 years ago. Thereafter, reports of smog occurrence came into Washington in large numbers, and the Public Health Service at one time had requests for investigations in more than 20 cities. Outstanding emergencies occurred in Los Angeles, attributed by many to the oil refineries in the area although the oil industry has spent large sums to combat air pollution.

Oil and ECA

The European Recovery Program may get a face-lifting before the ECA appropriation bill gets through Congress this year.

While the British order ousting dollar fuel oil from sterling markets will in itself be sufficient to lead some members of Congress to inquire into the situation, it is reliably reported that Secretary of State Dean Acheson, among others, is highly dissatisfied with the Marshall plan and will have a number of suggestions to make when he appears at congressional hearings.

Acheson is represented as feeling that the Marshall-plan countries are not making the effort they should to get on their feet, which is supported by unofficial reports reaching Washington to the effect that much of Europe believes we will not drop Marshall-plan aid even in 1952, but will continue it so long as the western European countries cry that Communism will overtake them if we quit.

Economic Cooperation Administration officials who have sought to convince European governments that they should take strong measures toward their own recovery, by cleaning their financial house, modernizing their production methods, and trading between themselves, have simply run up against an iron wall of uncooperation and, at times, resentful allegations that the United States is trying to run Europe.

The British oil order and the refusal of the European countries to cooperate with ECA in developing a refinery program which would not threaten a tremendous world surplus of oil and would leave room for American oil companies to participate in international trade, will be among the high spots of discussion when Congress starts work on the ECA appropriation.

bill also takes a more positive approach to the definition of "arm's length" sales than the original measure, providing that "a sale shall be deemed to be at 'arm's length' unless (1) it is by a person who is in such relation to the buyer by reason of voting-stock interest, common officers or directors, or other evidence of affiliation, that there is liable to be an absence of independent bargaining between them, or (2) the sale is, in fact, not arrived at by independent bargaining."

This provision, together with one requiring the commission to keep current information relevant to determination of whether, by reason of lack of competition among producers or gatherers, the flow of natural gas in interstate commerce may be unduly retarded or interfered with or the price of gas unduly affected, are the major modifications of the legislation.

The former, it was explained, will definitely instruct the FPC as to its authority, while the latter will serve to enable Congress at any time to get full and accurate information regarding the natural gas situation, which at times has been lacking in the past.

ITO Delay

Chances of ratification by Congress this year doubtful

WASHINGTON.—Prospects of ratification of the International Trade Organization charter by Congress this year are dim, largely because of apparent reluctance of the House foreign-affairs committee to undertake the long hearings necessary before the legislation could be sent to the floor.

The ITO, which would be a body of the United Nations, is designed to work for the elimination of artificial barriers to international trade, reduction of tariffs, and similar objectives. Ratification of the charter, which would make the United States a member, has been strongly urged by President Truman as a complement to the new reciprocal trade agreements which the administration has been negotiating with many foreign countries.

Partly as a result of the Marshall Plan, and partly because of the sharp contraction of foreign markets for American products which has taken place with the spread of communism and, in the case of oil, British plans to take over the American companies' sterling markets, opposition to the ITO is strong in many business and trade circles. Hearings, when held, are expected to bring more protests against ratification of the charter than demands that we join the ITO.

For the most part, however, time is seen as the most important factor against legislative action this year.

Lube-Oil Rating

New classification recommended by S.A.E. subcommittee would use five ratings, with tests at two temperatures

George H. Weber

NEW YORK.—Work toward a much-needed simplification of crankcase lubricating-oil viscosity classification now appears to be approaching culmination. The adoption of new S.A.E. ratings is seen as a possibility this summer.

While final deliberations in higher levels of the Society of Automotive Engineers are yet to come, it seems that agreement is near at the special subcommittee working level where the problem has been under study for several years.

It appears evident that at best the simplified reclassification of lubricating oils could not be effective before some date in 1951. Disagreement at any of three S.A.E. levels will postpone action indefinitely.

Probable recommendations.—The scope of the new classification system was revealed by an S.A.E. subcommittee last month when agreement was reached on points to be considered in revision. It was decided that the present S.A.E. 60 and 70 viscosity grades will be dropped as unnecessary. Further, it was agreed that no oils heavier than 110 S.S.U. at 210 F. would be considered. It also appears that viscosity ratings will be made at two temperatures: 0 F. and 210 F. and the ratings at 130 F. will be discontinued.

Just what the new classification will be is not yet known. It may resemble the suggested classification, listed in Table 1. This classification is known to represent the ideas of several members of the groups which have studied this problem. It conforms to the limits which the S.A.E. group agreed upon at Detroit, broadening the range of heavy oils and limiting the heaviest grade to 110 S.S.U. at 210 F. and employing two test temperatures.

The two heaviest grades, listed as (x) and (y) for identification only, were not assigned numbers in the suggested form. Grade (x) corresponds roughly to the current viscosity ranges of S.A.E. 30 and 40 while Grade (y) is about the same as S.A.E. 50.

Present system.—The current system for classifying lubricating oils by viscosity calls for seven official S.A.E. grades as shown in Table 2.

In addition to the above S.A.E. classification, a separate Automotive Manufacturers' Viscosity Classification lists two winter grades: No. 10W ranging from 6,000 to 12,000 S.S.U. at 0 F.; and 20W, ranging from 12,000 to 48,000 S.S.U. at 0 F. To complicate the picture further, a new light winter grade termed 5W has been suggested. This grade, not an official classification, is finding greatest acceptance in Canada for extreme low-temperature operation. Its viscosity at 0 F. is on the order of 3,200 S.S.U.

This classification of nine different grades has been outmoded by improvements in engine design and lubricating-oil characteristics. The system contributes to confusion on the part of the consumer and comprises a needless burden to the refiner and marketer who must blend and stock some grades which attract a negligible market demand. For example, current sales of S.A.E. 50, 60, and 70 oils account for less than 5 per cent of total volume. The need for grades heavier than S.A.E. 50 no longer exists for automotive vehicles in current use.

The suggested classification, which may or may not be accepted, represent a plausible compromise of opinions on what the new system should compromise. Depletion of present S.A.E. 10, 60, and 70 allows the combining of regular and winter oils in only five grades, as compared with the present nine.

It is not expected that the proposed 5W grade will be considered in the new classification at this time. Its possible addition to the official classification will doubtless await a greater demand and further study of performance in field operation.

Developing new ratings.—Two groups representing the petroleum and automotive industries have figured largely in the reclassification effort. Initiative for action in the S.A.E. lies with its Special Subcommittee B of

TABLE 1—SUGGESTED LUBRICATING-OIL VISCOSITY CLASSIFICATIONS

Viscosity No.	Allowable viscosity range	
	Minimum	Maximum
10W	6,000 S.S.U. at 0 F.	12,000 S.S.U. at 0 F.
20W	12,000 S.S.U. at 0 F.	48,000 S.S.U. at 0 F.
20	44 S.S.U. at 210 F.	58 S.S.U. at 210 F.
(x)	58 S.S.U. at 210 F.	80 S.S.U. at 210 F.
(y)	80 S.S.U. at 210 F.	110 S.S.U. at 210 F.

TABLE 2—PRESENT CLASSIFICATION SYSTEM

S.A.E. viscosity No.	Viscosity range	
	Minimum	Maximum
10	90 S.S.U. at 130 F.	120 S.S.U. at 130 F.
20	120 S.S.U. at 130 F.	185 S.S.U. at 130 F.
30	185 S.S.U. at 130 F.	255 S.S.U. at 130 F.
40	255 S.S.U. at 130 F.	80 S.S.U. at 210 F.
50	80 S.S.U. at 210 F.	105 S.S.U. at 210 F.
60	105 S.S.U. at 210 F.	125 S.S.U. at 210 F.
70	125 S.S.U. at 210 F.	150 S.S.U. at 210 F.

Next Week

Radio, practically automatic.—Keystone Pipe Line Co. (subsidiary of Atlantic Refining Co.), has become the first pipe-line operator to use a micro-wave radio, relay-type system, for communications. Engineering data for the new installation, which features an ultimate capacity of 23 special channels, are given by J. D. Munton, manager of communications for Keystone.

Semimicrofractionation.—New useful equipment for refining studies detailed by A. V. Cruthirds, W. C. Jones, and W. D. Seyfried, Baytown refinery, Humble Oil & Refining Co.

Planning modern gas compressor stations.—First installment of a series of five authoritative articles covering this important subject, by Tyler G. Hicks, consulting mechanical engineer.

Relative permeability.—Second and concluding article by E. R. Brownscombe, R. L. Slobod, and B. H. Caudle, research laboratories, Atlantic Refining Co., Dallas.

Refinery capacity stepped up 50 per cent.—How this was accomplished at Cushing, Okla., refinery of Midland Cooperative Wholesale is described by R. B. Tuttle of the Journal's engineering staff.

Flowline paraffin removal.—New soluble plug and special injector valve are basis of method. By D. H. Stormont, district editor.

the Fuels and Lubricants Technical Committee. Cooperating in the study is a group in the American Society for Testing Materials—a subcommittee of the A.S.T.M. Technical Committee B on Lubricating Oils, in turn part of the society's Committee D-2 on Petroleum Products and Lubricants.

At the annual S.A.E. meeting in Detroit last month, Subcommittee B, headed by H. C. Mougey of General Motors Research Laboratories, reached agreement on several revision points. Having received recommendations from the A.S.T.M. body, this group outlined in general the limits within which its recommendations will fall.

It is now believed that the S.A.E. group, after possible further discussion with the advisory A.S.T.M. group, will be able to draw up firm recommendations. If so, they will be placed in the hands of members of the S.A.E. Fuels and Lubricants Technical Committee 3 weeks before the society's June meeting at French Lick, Ind.

Favorable action at this level will then be subject to letter ballot by members. Assuming the recommendation holds favor, it will then pass to the final level, the S.A.E. Technical Board. Favorable action by this body, if reached promptly, would result in the new classifications being listed in the 1951 S.A.E. Handbook. Current regulations require a lapse of 18 months after final board approval before such changes become effective in the field. This period may possibly be shortened.

SOUTHWEST

Allowable Change

Texas thought ready to junk M.E.R.'s as production basis

D. H. Stormont

AUSTIN. — The Texas Railroad Commission's method of allocating oil production between fields—that of using "most efficient rates" of production for all flush fields plus a sufficient number of shut-down days to hold their output within market-demand estimates — is slated to receive extensive discussion at the next statewide hearing. Possibly, the method may be abandoned, or at least revised.

That such action was contemplated was revealed in a statement made last Saturady by its chairman, William J. Murray, Jr. He stated he believed the M.E.R. basis should be kept as a ceiling for how much individual fields could produce, but not as a basis of prorating production between fields.

His statement was made in connection with a possible increase in the number of producing days granted East Texas field, which during the past year generally has been allotted 2 days less than other Texas prorated fields. Both other commission members, Gen. E. O. Thompson and Olin Culberson, have already stated they favored such action if the extra oil could be produced without waste.

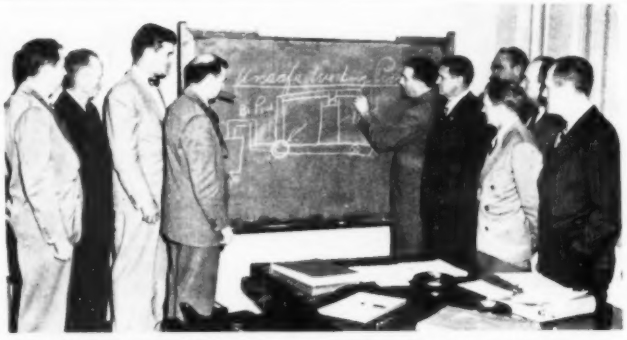
"Certainly we could give East Texas more producing days without hurting the field," Murray stated. "But right now it is on a parity, and more, with other fields under the M.E.R. basis. I believe the time has arrived to change the basis."

He added that testimony likely will be received at the February 17 hearing, in San Antonio, on possible changes in the method of proration.

The current M.E.R. basis was instituted during the war years to prevent damage to oil fields because of excessive drainage rates. Prior to that time field allowables were distributed on the basis of market demand and well depths. If the M.E.R. basis is thus discarded as a method of establishing field allowables, it is not unlikely that the prewar formula, or something similar, will serve as the basis for proration.

Two factors which have probably contributed most to the current situation—other than that of an oversupply of crude—are the very low production rates in East Texas field and the very high rates in Scurry County's reef fields. On a calendar-day basis, wells in the former currently are producing slightly less than 10 bbl.; in Scurry County they are allowed about 120 bbl.

East Texas operators feel they are not receiving their fair share of the state's quota; that the reef field's allowable should be cut. But as Chairman Murray pointed out at the January statewide hearing, the M.E.R. of 220 bbl. daily (or 120 bbl. on a calendar-day basis) was the least rate of production recommended by any of the fields' operators. Thus to arbitrarily cut the allowable of the reef fields below this figure would not be in line with the commission's announced policy.



SET SAFETY RECORD.—The 7,004 employes of Stanolind Oil & Gas Co. set a new safety record during 1949, with a total of 14,924,466 hours worked with only 48 lost-time accidents. Largely responsible for the record were the company's safety supervisors, some of whom are shown above during a 3-day meeting held in Tulsa last week. Representing the four divisions, covering 11 states in which Stanolind has producing operations, they are shown listening to Don Klemme explain circumstances responsible for one of the 48 accidents. Left to right: Ray Tolson, plant-protection superintendent, Brownsville, Tex., chemical plant; W. E. Stackhouse, assistant safety supervisor; Fred Claiborne, safety assistant; William B. Cox, supervisor in Texas, Louisiana Gulf Coast division; Klemme; D. J. Clutterbuck, senior clerk, safety section; H. P. Hartwell, Jr., Rocky Mountain division; (behind Hartwell) J. G. Potter, North Texas-New Mexico division; S. G. Buford, research laboratory; and H. F. Watters, central division. The 3.22 frequency rate for 1949 ranks Stanolind Oil & Gas as one of the nation's safest places to work, according to E. F. Bullard, president.

TRANSPORTATION

Tanker Growth

All of 1949's major vessels were tankers, speaker says

NEW YORK.—The important position held by tankers in the American shipping and shipbuilding industries was stressed here last week by J. Lewis Luckenbach, retiring president of the American Bureau of Shipping, at the bureau's annual meeting.

All major vessels completed by American shipyards last year were tankers. They numbered 33 vessels

of 863,292 deadweight tons employing 434,150 hp. of propelling machinery, Luckenbach said.

"The privately owned American flag tanker feet of 443 units, totaling 6,790,801 deadweight tons, represents about 27 per cent of world tankship deadweight tonnage . . ." he said. This is one of the most modern national tanker fleets in the world, averaging about 7 years in age, 14 knots speed, and about 15,300 tons in deadweight tonnage. It has almost twice the carrying capacity of the prewar fleet of 353 units.

"In addition to these vessels, approximately 80 per cent of the 2,650,000 deadweight tons of tankers registered in Panama are American owned. Thus, with the additional American owned tankers under other foreign flags, more than one-third of the current world tankship tonnage of 25,000,000 deadweight tons is privately controlled in the United States."

Besides tankers built in the United States last year, a large number of vessels were completed for inland waterway use.

The bureau head pointed out that 37 large merchant vessels, mostly tankers, are now on order in American shipyards.

GULF COAST

Louisiana Price Cut

Stanolind Oil & Gas Co. and Sun Oil Co. have reduced the posted price for crude oil from Hackberry (East and West) field in Cameron Parish, Louisiana. The new price meets the price posted for similar crude in other fields by other companies.

The new schedules call for a price of $2.41 per barrel for crude below 24 A.P.I. gravity. Former price was $2.54. This reduction of 13 cents applies throughout the schedule for Hackberry crude. The schedules call for an increase of 2 cents per barrel for each degree of gravity between 24 and 34. For 34 gravity and above the price is $2.63.

Water Injection Planned

BATON ROUGE. — A 6-month experimental water - injection program will be conducted by Crown Central Petroleum Corp. in Iota oil field, in Acadia Parish, Louisiana.

Conservation Commissioner S. L. Digby issued a permit authorizing the trial in the Duson sand in the central main fault block in the western portion of the field, which in recent months has suffered a substantial decline in bottomhole pressure.

The program, Digby said, should retard the decline in pressure and thus prevent the loss of oil. The Duson sand was defined as that encountered in Crown Central's 1 H. T. Duson at 8,792-8,825 ft.

CONSERVATION

Increased Recovery

Survey of nationwide secondary-recovery activities shows increasing number of injection, flooding projects operating

OKLAHOMA CITY.—The use of secondary - recovery methods to increase the production of older oil fields is increasing throughout the country.

This is shown by a survey now being made by Albert E. Sweeney, Jr., director of the secondary-recovery division of the Interstate Oil Compact Commission.

Until recent years the principal areas where secondary-recovery projects were in use were Pennsylvania, New York, and Oklahoma. Now they are numerous in other Mid-Continent states and there are several in California and the Rocky Mountains.

A survey made by the American Petroleum Institute 3 years ago showed a total of 1,253 projects in operation then, 529 gas-injection and 724 water-injection projects. These covered more than 400,000 acres and were responsible for a daily production of 200,000 bbl. of crude.

Sweeney has been bringing this old survey up to date. The highlights of some of his findings follow:

Kansas.—There is an increasing tendency to unitize large blocks for development. In Kansas, where more than 275 permits have been issued for water flooding, a number of very successful units are in operation. Within the past year 56 new permits were issued in this state alone. Oil recovery from secondary projects in Kansas in 1948 is estimated to be in excess of 5,000,000 bbl.

Illinois.—In Illinois projects are in progress in 38 fields and several new projects are being planned or have received permission to begin. The success of projects to date in Illinois indicates that the use of water injection for increasing recovery will in all probability continue to increase. Many of the operators believe that this will be the largest single factor in increasing the rate of production from Illinois.

Texas.—In Texas, where gas injection has been practiced for some time on a wide scale and where water flooding and water injection have been used in only a few cases, there are an increasing number of projects being planned or proposed to utilize water injection. This is probably due to the wide publicity given to the beneficial results obtained through salt-water disposal in East Texas field. In this field it is estimated that the ultimate recovery will be increased by more than 600,000,000 bbl. by the use of this method.

Todd field, which was the first unitized project in Texas under the recently passed unitization law, is the latest of the projects announced to utilize water injection. Perhaps a large number of additional projects will be started as the experience from other projects becomes more widely known. Water flooding in Texas, which until recently had been confined principally to the shallow North Central Texas area, is now being practiced in nearly all sections of the state on a relatively small scale.

Arkansas.—In Arkansas a number of projects of considerable size have been in operation sufficiently long to indicate that the additional recovery will be even larger than was initially estimated. In addition, several projects have been started within the past year, notably Wesson, Lisbon, and Hillsboro.

Louisiana.—In Louisiana, a preliminary survey has been conducted by the Conservation Department of the state to obtain data relative to the projects now in operation. There are 22 projects utilizing injection in this state, including several water-injection projects on a field-wide basis which have been very successful in maintaining pressures and decreasing operating costs. Perhaps within a short time, as more experience is gained, certain of the shallower zones in the north part of Louisiana will be subjected to water flooding.

Oklahoma.—Several large projects have been started in Oklahoma. With the formation of the North Burbank Water Flood Unit, which will be the largest *(see The Oil and Gas Journal, December 1, 1949, page 37)*, the production from secondary recovery projects in Oklahoma will get a tremendous increase. In this state, where the recovery to date from secondary-recovery operations is the largest of any state outside of the eastern states of New York and Pennsylvania, the use of water injection is increasing. Many additional projects have been started in the last year in the shallow Bartlesville sands of Washington and Nowata counties, and in addition some projects in operation have been enlarged. In all probability, from information assembled to date, Oklahoma may become the largest secondary-recovery producer in the United States within a short time.

Concession Contracts

Study shows wide variety of terms, conditions characterize oil-production agreements with other nations of the world

Dahl M. Duff

A GREAT variety of terms, conditions, and obligations characterize the present oil-concession contracts in force in foreign areas.

These have been developed out of negotiations with the individual governments and are an important component in the over-all cost of production.

The accompanying tabulation summarizes some of the salient features of contracts for exploitation, or producing, concessions in 11 countries. These include the major foreign producing areas.

Such a tabulation, it is emphasized, does not show the background circumstances of the individual contracts, nor does it show many other terms, such as refining or export obligations, exchange, or tax requirements. These, to the operating company, often are of more importance than rental and royalty payments.

Included in the tabulation are both countries where oil concessions are granted under a petroleum law and also the Middle East countries where contracts cover wide areas and are individually negotiated. In Indonesia, contracts were granted under the old 5a section of the Dutch law.

To the large oil company, each country presents a completely different situation insofar as the possibilities of an oil-production agreement are concerned. First, of course, the oil must be found in commercial quantities, and this calls for an exploration concession or permit.

Concession terms.—The conditions under which this exploration is carried into the production and development period must be defined in the contract or the basic petroleum law. The information in the accompanying tabulation is largely confined to the concession requirements in the production period.

There are a number of other terms besides the royalty and rental payments that often determine the acceptability of a particular contract. Sometimes the length of the exploitation period is considered too short to allow the investing company time to recover its expenses and normal return. At the end of the exploitation period, the company's property passes to control of the government, itself, under the usual contract.

Another frequently objectionable feature is the size of the area allowed for exploration and subsequent exploitation. Limits on the area sometimes prevent large-scale operations. This is one of the objections to Italy's present oil law.

Numerous other factors enter into these contracts. In some of them are found refining obligations and deadlines for the commencement of commercial export. Nationalistic feeling sometimes results in the inclusion of provisions limiting participation by foreign capital.

The basic consideration is the oil possibilities of the territory involved. Operations on semiproved land with less risk to the company generally carry higher return to the land-owning government. Highly favorable terms are called for to bring about the initial drilling and exploration on completely wildcat prospects.

Of interest in connection with the situation regarding foreign oil concessions is the attitude of one large international company. It is guided by a policy based on three fundamental requirements. These are: that it shall retain right of management (precluding deals in which it is a minority partner with government); safety of its investment and security of title to its property; and the opportunity to make a reasonable profit.

Western Hemisphere.—In the Western Hemisphere, oil concession terms generally conform to basic petroleum legislation of the country itself. Several countries exclude or discourage foreign oil capital and dominate the industry through a government organization. The notable example is Mexico, though in the last 2 years contracts have been signed for limited foreign operation and others are being sought. Brazil, Chile, Argentina, and Guatemala restrict or forbid operations by foreign oil interests.

The general outlook of a particular government toward foreign investment is an important factor. It has been said that the Alberta provincial government under its laws holds powers over the oil industry which in some other countries would represent a real threat for a major operator. In Canada, however, the tradition is one of respect for and cooperation with private capital.

Venezuela's basic petroleum law, passed in 1943, includes features which have been incorporated in the oil laws of various other countries. These include the selection of up to half of the exploratory acreage with the remainder going into a national reserve for later award to the best bidder.

Venezuela and Colombia both illustrate the fact that the more burdensome conditions on the operating oil company frequently are found outside the petroleum law. Cost of Venezuelan production is said to approach closely to that in the United States. Labor charges, taxes, and to some extent currency exchange controls all contribute to the situation.

Middle East.—In the Middle East, the concession contracts are the result of individual negotiation and show wide variation, depending on time at which they were obtained, oil possibilities of the area, and other factors. Some of the early companies in the Persian Gulf were given more favorable contracts 15 and 20 years ago when they undertook exploration of practically unknown territory. The Neutral Zone contracts signed since the war both contained surprisingly high payments to the governments, reflecting par-

CONTINUING CONSTRUCTION.—Work on the new Dunkirk refinery of Anglo-Iranian Oil Co., Ltd., will still be under way long after the refinery goes into partial operation this month. A 6,000-bbl. distillation unit already has been completed. Shown here is a site where other process units soon will be erected. For details of the Dunkirk construction program, see The Oil and Gas Journal, January 26, page 169.

SUMMARY OF CONCESSION TERMS (FOR PRODUCTION OPERATIONS)

Country—	Royalty,* cents per barrel or per cent	Other payment	Term of contract	Concessionaires and remarks
Canada (Alberta Crown lands)	12½ per cent	91 cents per acre per year lease rental.	Life of production.	Most major U. S. and Canadian operators.—Province holds right to raise royalty to 16⅔ per cent. One-half reservation eligible for lease; remainder on bid basis.
Colombia† (Government lands)	3 to 13 per cent	61 cents per acre per year surface fee.	30 years, renewable for 10 years.	Tropical, Colombian Petroleum, Shell, Socony-Vacuum, and Texaco.—Royalty decreases as pipe-line distance to coast increases. Two largest existing concessions, Barco and De Mares, carry negotiated 10 per cent royalty.
Venezuela	16⅔ per cent	Initial surface fee about $1 per acre, plus annual surface rental, about 65 cents per acre.	40 years, most existing concessions from 1944.	Creole, Shell, Mene Grande and 10 other operators.—Tax laws designed to give government total share equal to net company profits. One-half exploration acreage can be converted; remainder on bid basis.
Mexico	Not standard	Mexican American Independent Oil Co.—Contract provides company and government share production 50-50 until company recovers expenses, then company receives 15 per cent, 16¼ per cent, and 18¼ per cent from upland, lagoon, and offshore wells respectively. Term, 12 years upland, 15 years in tidelands. Each of 10 selected structures stands as a unit in the contract. Government (Pemex) controls production operations.		
Iran‡	22-23 cents	20% of amount in excess of £671,250 (5%) actually distributed to shareholders in any one year.	60 years—May 29, 1933 to Dec. 31, 1993.	Anglo-Iranian Oil Co., Ltd.—Royalty is 4 shillings sterling per ton with value fixed to gold as of time contract was signed. Payment in lieu of taxes now £300,000 annually.
Iraq:				
Iraq Petroleum	22 cents	£400,000 (gold) minimum annual payment.	75 years from March 14, 1925.	Iraq Petroleum Co., Ltd.—Royalty is 4 shillings gold per ton until July 14, 1954. For each subsequent 10-year period, royalty rate is modified by past profit or loss within limit of 2 and 6 shillings (gold).
Basrah Petroleum§	20 per cent in-kind plus 22 cents on remaining 80 per cent	£200,000 (gold) annual minimum, doubled under certain conditions.	75 years from November 30, 1938.	Basrah Petroleum Co., Ltd.—Royalty of 20 per cent in kind and 4 shillings (gold) on remaining 80 per cent until 20 years after commencement of regular exports. For each subsequent 10-year period, royalty modified as with I.P.C. 20 per cent oil in kind may be sold back to company but cannot be sold by government for export.
Kuwait	9.3 cents	Rental of 75,000 rupees prior to production.	75 years from December 23, 1934.	Kuwait Oil Co., Ltd.—Royalty is 3 rupees per long ton or 250,000 rupees per year, whichever is greater, plus ¼ rupees in lieu of taxes. 475,000 rupees initial payment.
Neutral Zone:				
Kuwait interest	35 cents	$640,000 annual guarantee of 15% of profits reported.	55 years from 1948.	American Independent Oil Co.—$8,300,000 bonus payment reported.
Saudi Arabia interest	55 cents	$1,000,000 annual minimum plus 25% of profits net before taxes.	60 years from February 20, 1949.	Pacific Western Oil Co.—$9,500,000 bonus paid. 25 per cent of profits is on sale of products not refined locally. 20 per cent of net profits, before taxes, from refinery operation.
Qatar	8.5 cents	300,000 rupees annual payment in addition to royalty.	75 years from May 17, 1935.	Petroleum Development (Qatar), Ltd. (I.P.C.)—Royalty is 3 rupees per ton except on asphalt and ozokerite which carries 1 rupee 8 annas per ton.
Saudi Arabia	22 cents	$150,000 initial payment.	66 years from July 14, 1933.	Arabian American Oil Co.—Royalty is 4 shillings gold per ton or equivalent in dollars or sterling.
Indonesia	12 per cent	Rental per acre per year equivalent to about 2.6 cents.	50 years.	Principally Standard-Vacuum Oil Co. and Shell.—Government shares in net profits up to 20 per cent, in effect alternatively increasing basic 4 per cent royalty to 12 per cent if profits are under 25 per cent excluding depreciation.

*Rates in other currencies have been converted to U. S. money on present exchange rates.

†Figures shown are for the slightly higher royalty scale and exploitation surface fee established in the decree-law promulgated in January 1950.

‡Contract revision negotiated but not yet finally accepted. Reported to provide 50 per cent increase in basic royalty rate retroactive to end of 1948, along with other changes.

§Terms virtually the same for Mosul Petroleums Co., Ltd., concession in Iraq. This, however, provides for no increase in the minimum. Individual exploitation contracts under Section 5a. Data given is for one agreement presumed to be representative.

ticularly the fact that the territory is close to Kuwait's Burghan field.

In these Persian Gulf contracts, the bonus payments for the older concessions are of relatively little significance, since they are "one-time" propositions. Of more importance is the annual minimum, except in Kuwait, where it is now far exceeded by the royalty. The bonus payments have included a yacht for the shiekh of Kuwait, given as an added consideration for the Neutral Zone concession.

These specified government payments, in the Middle East as elsewhere, do not represent, of course, all the oil-company support to the country's economy. Housing projects, schools, medical facilities, and similar programs are a part of the oil company's outlay. In the Middle East, it is sometimes considered that such expenses equal those for the operations themselves.

Another complicating factor in the Middle East contracts is the fact that payment is tied to or made in gold for the concessions in Iran, Iraq, and Saudi Arabia. Royalty throughout the Middle East is on a flat fixed figure.

Four shillings gold per ton as a royalty rate equals about 22-23 cents per barrel when the gold sovereign of 20 gold shillings is considered to be worth $8.24. This is the value placed by the International Monetary Fund on the amount of gold the sovereign contains. Actually, the gold sovereign sold on the free market brings approximately $13, and when considered from this standpoint, the four shillings gold per ton is about 30 cents per barrel. The Iranian contract contains a provision safeguarding Iran against changes in the value of gold, thus requiring the company to pay in sterling on a gold-sterling rate fixed at the time the contract was negotiated.

MEXICO

New Oil Field

Minatitlan refinery taking crude from Mexican test

CRUDE oil from Mexico's latest discovery this week was moving through a new pipe line to the Minatitlan refinery in southern Veracruz.

Completion of the 1 Tortuguero, near the southern tip of Veracruz State, was announced last week by S. B. Mosher, president of Signal Oil & Gas Co. Signal holds the largest interest in the company which drilled the well, Mexican American Independent Oil Co.

The well, the first drilled by Mexican American Independent under its contract with the Mexican Government, on production tests showed a potential of about 5,000 bbl. daily with an estimated 5,000,000 cu. ft. of wet gas, Mosher said. Last week it was being produced through a small choke.

On the basis of earlier tests, Petroleos Mexicanos, the government oil agency, had laid a pipe line from the new field to the 20,000-bbl. refinery at Minatitlan. This refinery was built to process heavy crude oil from the old Agua Dulce field, about 10 miles from the new discovery.

Mosher's statement indicated that Mexican American will skid the rig used in drilling the discovery to a new location to begin development drilling.

The 1 Tortuguero was completed in two zones and is bottomed at a point between 2,000 and 3,000 ft. offshore in the Gulf of Mexico.

Mexican sources reported Mexican American's other wildcat in the country, the 1 Xicalango in Campeche State near Ciudad del Carmen, had encountered a second gas sand. Drilling previously had been suspended for a short time when high pressures were encountered at about 4,000 ft.

New Company

Foreign-backed firm formed to drill 30 wells in Mexico

THE Association of Drillers of Mexico has been organized and will shortly undertake a drilling program for Petroleos Mexicanos, according to dispatches from Mexico City.

The company is headed by Enrique Valle Cambre and is backed by foreign capital of "various countries," it was said. The company will function according to Mexican laws, with any production obtained to be handled by Pemex.

The Mexican reports spoke optimistically of a program under which the company would drill 30 wells and quoted Cambre as saying a large number of drilling rigs were being arranged for from United States suppliers.

Oil-company officials in New York familiar with affairs in Mexico were inclined to take a "wait and see" attitude on these reports. They said similar projects announced in the past had not materialized or only on a greatly reduced scale.

Despite this, there has been general expectation recently that Pemex, headed by Antonio J. Bermudez, will shortly disclose new contracts with private firms for exploration in Mexico. Bermudez was reported to be on tour of the Poza Rica area with some of his staff and Edwin W. Pauley, a 13 per cent interest holder in Mexican-American Independent, who is planning other exploratory projects in the country.

In a recent interview in Mexico City, Bermudez again declared that participation by private capital in Mexican oil development is both welcome and legal. He said there are, in general, two types of contracts being offered private capital. One is that taken by Mexican-American Independent recovering expenses from half the production and profit out of a further fixed share. The second, illustrated by the arrangement with G. A. Wiegand, San Antonio, calls for payment of a flat sum per barrel produced. Dry holes are at the operator's expense in either case.

Wiegand, associated with Fred Wiegand, has been working in the Panuco area. Six of the seven wells drilled by Wiegand last year were successful. Bermudez said the contract called only for the drilling of three wells and said it is significant that more than double this number were drilled.

Pipe Import Duty Cut

The Mexican Government has made a sharp reduction in the duty on imports of pipe to assist Petroleos Mexicanos and United States contractors working on oil exploration in Mexico.

The ad valorem duty on large-size steel line pipe and casing was cut from 40 per cent of value to 5 per cent. It was also reported that a leading Mexican steel mill, Altos Hornos de Mexico, together with Tubos de Monterrey, a pipe-manufacturing firm in Monterrey, has taken the job of supplying a greater part of the line pipe and casing needed by Pemex.

SOUTH AMERICA

Wildcat Review

Western Venezuelan test approaching depth record

THE Alturitas wildcat of Creole Petroleum Corp. in Western Venezuela, deepest well drilled by the company, is at 14,965 ft. and expected to go deeper in search of limestone production.

The well is south of Machiques, District of Colon, on the west side of Lake Maracaibo. At last report it was cementing 7-in. casing. The depth of 14,965 ft. approaches the South American depth record held by Shell's Rio Catatumbo well in Western Venezuela which went to 15,637 ft.

Among other exploratory operations being watched with interest in Venezuela is the CQ-1 well of Shell Caribbean Petroleum Co. in the State of Trujillo. The well was testing at about 1,700 ft., and a Venezuelan newspaper reported Shell had been successful, finding good light-quality oil.

Another Shell well, DMC-1, is now below 11,620 ft. This test is being made between Mara field and Lake Maracaibo. Venezuelan Oil Concessions, Ltd., also a Shell subsidiary, is continuing development of the new Sibucara field with S-6 reported drilling below 2,000 ft.

Creole has indefinitely suspended its Curamichate well at 7,397 ft. The operation is located southeast of Cumarebo on the Caribbean Coast.

Exploratory operations of Mene Grande Oil Co. include Los Manos, south of Santa Ana, Eastern Venezuela, drilling below 6,060 ft.; La Vieja 1, west of Urica, Eastern Venezuela, below 420 ft.; and Tagua 1, drilling below 3,000 ft.

Socony-Vacuum Oil Co. of Venezuela has abandoned its South Nipa 22 at 8,954 ft. The well was a stepout and had production been found, would have proved some additional acreage. The same company is drilling below 3,500 ft. in Cachama 1. This test is several kilometers to the northwest of Chimiri field and north of Socony-Vacuum's Morichi well. In Barinas, Socony-Vacuum is drilling below 9,400 ft. in Silvestre 6, northwest of Sylvester 5.

Phillips Oil Co. has abandoned its wildcat, Santa 1. The well went to 11,401 ft. The company has spudded in a new wildcat test to the west, Aragua 1. These operations are west of El Roble in Eastern Venezuela.

Venezuelan Atlantic Refining Co. was last reported preparing to test its Ruiz 3-19 in Rinz field at a depth of about 4,604. This company is drilling Guasare 1, a new field wildcat in the Amana area of Western Venezuela, last reported at 9,268 ft. Brit-

ish Controlled Oilfields, Ltd., is at 7,994 ft. in El Mene 1. Western Venezuela, and Sinclair Oil & Refining Co. is at 7,655 ft. in SB-133 in Eastern Venezuela.

Chilean Exports

Uruguay to be first buyer of Tierra del Fuego crude

THE Corp. de Fomento of the Chilean Government is preparing to celebrate shipment of the first cargo of Chilean crude oil.

A contract for the purchase of the Chilean crude has been negotiated with Administracion Nacional de Combustibles Alcohol y Portland (ANCAP) which operates a 15,700-bbl. daily refinery at La Teja about 5 miles from Montevideo, Uruguay.

The contract is for 180,000 cu. m. (about 1,130,000 bbl.) over a period of 18 months. Shipments will be picked up at Caleta Clarencia on the Straits of Magellan, terminal of the pipe line to the Cerro Manantiales field.

The first shipment will be brought by the tanker Ancap III the middle of February, and its arrival will be marked with ceremonies attended by high Chilean Government officials, directors and technicians of the Corp. de Fomento and ANCAP, and other guests.

The completion of the first shipment will mean the culmination of more than 4 years of development work which has taken place since the first discovery in the world's most southerly oil field in December 1945. Since then additional wells have been drilled, a pipe line laid, and a terminal constructed.

This 42½-mile, 8-in. line was placed in operation with the first batch of crude oil about December 30. At the Caleta Clarencia terminal, the submarine lines have been finished and two 80,000-bbl. tanks erected. Work is continuing on the other storage consisting of two 55,000-bbl. and one 20,000-bbl. tanks.

About 15 of the producing wells in Cerro Manantiales have been connected. Some other producers are not yet connected since there are no facilities for emulsion breaking. The corporation is continuing to operate two rigs in Cerro Manantiales.

Another rig has been drilling a test on the Angostura structure about 5 miles northwest of Cerro Manantiales. The well, first in the area, is now being tested, and is apparently a gas-distillate producer.

The same type production was obtained in the Espora area about 7 miles north of Cerro Manantiales. The other rig is drilling the Cerro Sombrero structure about 10 miles southeast of Cerro Manantiales. The corporation has abandoned for the time being further efforts at San Sebastian.

Shell Reorganization

Several changes have been made recently in the organization of the Shell companies operating in Venezuela in what officials of the company described as simplification of the corporate structure.

Venezuelan Oil Concessions, Ltd., has taken over all assets and liabilities in Venezuela of Shell Oil Co. of Venezuela, Ltd., Venezuelan Oil & Transport Co., Ltd., and Petroleum Investments (Overseas), Ltd.

All concessions in the name of the latter two of these three companies in Eastern Venezuela, as well as the Cardon refinery of Shell Oil Co. of Venezuela, Ltd., will be transferred to V.O.C.

In addition, all concessions situated in Lake Maracaibo held in the name of V.O.C. will be transferred to Shell Caribbean Petroleum Co.

"Steep Inch" Contract Let

Macco-Pan Pacific, Caracas, has been given contract for construction of the 10.4-mile products pipe line of Creole Petroleum Corp. from Catia de la Mar to Caracas.

Work on the project is expected to be completed in late summer. The 8⅝-in. line has been called the "Steep Inch" since in some places the gradient is as much as 60 per cent.

Most of the pump-station construction will be handled by Creole. Half interest in the line and station is held by Shell. Creole has completed erection of practically all tankage planned at Catia de la Mar.

Construction of the pipe line will make unnecessary the tank-truck hauls now being made over the mountainous 20-mile road from the seacoast to Caracas.

Colombian Slowdown

Reflecting the reported tapering off of the operations of Richmond Exploration Co. in Colombia, a number of Richmond officials and technicians have been transferred to Venezuela and the United States.

M. E. Hoover, former general manager of Richmond in Colombia, has returned to the United States. R. J. Bauman, geologist, is being returned to the United States. Richmond personnel transferred to Venezuela include E. L. Patchett, chief geologist; G. J. Hulsewe and R. R. Kitch, seismologists, and C. R. Johnson, geologist.

Tropical Allowed Increase

Tropical Oil Co. has been granted a part of the increase in price requested on the sale of petroleum products in Colombia.

The Ministry of Commerce of the Colombian Government allowed an increase of 6 centavos per gallon (about 3 cents) on motor fuel, half the amount asked, and increases from 3 to 5 centavos on distillates and an average of 15 centavos on lubricating oil.

Tropical is the major marketing company in Colombia with sales of some 115,000,000 gal. annually of motor fuel. The company's request for the increases has been under consideration about 6 months. Service-station price of gasoline in Bogota is now 54 centavos (about 27 cents).

Argentina Lets Contract

A contract for the intermediate booster compressor station on the Comodoro Rivadavia - Buenos Aires natural-gas pipe line in Argentina has been awarded to Agar Cross & Co., Ltd.

The contract covers purchase of equipment for the installation and will include construction. About 1,300 hp. compressor capacity will be installed initially, to be expanded to 1,500 hp. later. Conesa is south of Bahia Blanca at about the halfway point on the 1,055-mile line.

The Comodoro Rivadavia station, also contracted to Agar Cross, is reported nearly complete. No contract has yet been reported for either engineering, purchase or construction of the light-fractions recovery plant also to be built at Conesa. The pipe-line project is under the Argentine Direccion General del Gas del Estado.

EUROPE

Chemical Plants Planned

Plans for the construction of petroleum chemical plants in two European countries, France and Austria, were made public last week.

Soc. Generale des Huiles de Petrole, French affiliate of Anglo-Iranian Oil Co., Ltd., is one of three French companies participating in a chemical plant at L'Etang de Berre by Soc. Naphtachimie.

Total cost of the project is the equivalent of $13,853,000. Included is an approved grant of $853,000 in ECA financing for American engineering fees and special equipment to be purchased in the United States.

In operation, S.G.H.P. will supply a naphtha fraction from its Avera refinery to the adjacent chemical plant. Production will include chemical raw materials for plastics, synthetic fabrics, varnishes, lacquers, and other products. The plant will have an output of about 83,600 metric tons of chemical products annually.

In Austria, it was announced all-Austrian capital had been subscribed for the construction of a petrochemical plant operating on crude oil in the Linz port area. The company will be Oesterreichische Mineraloelchemie, A.G.

FRANK ITTNER

EDWIN L. SMITH

New Vice Presidents

Superior Oil Co. names Edwin L. Smith to foreign post; Frank Ittner formerly served as exploration manager

SUPERIOR OIL CO. recently named two of its district and exploration managers as vice presidents, and they are now serving in their new assignments.

Edwin L. Smith, formerly district manager at Oklahoma City, is in London in connection with foreign interests, and Frank Ittner, manager of the company's exploration department for the Pacific division, will remain in Los Angeles.

Smith, who joined the company's legal department in Los Angeles in 1943, was sent to Oklahoma City in 1946 as district manager, with supervision over operations in New Mexico, West Texas, Kansas, Oklahoma, and Nebraska.

A graduate of the University of Kentucky where he majored in geology and engineering, Smith joined Union Oil Co. of California shortly after graduation, and while working with Union attended the University of Southern California, where he later received a law degree. He served several years in Union's legal department, and during World War II was for a time a member of the legal staff of the U. S. Corps of Engineers.

Frank Ittner, a graduate of the University of Oklahoma, with a B.S. degree in mechanical engineering, joined Superior in 1936 as a seismic computer. He has held positions of seismograph party chief, chief seismologist, Pacific division, and manager of exploration, Pacific division, including the Pacific Coast states, West Texas, Oklahoma, Kansas, Nebraska, the Dakotas, the Rocky Mountain states, and Canada.

He is a member of the American Association of Petroleum Geologists, and the Society of Exploration Geophysicists.

Prior to joining Superior he served as a member of a drilling crew in the Oklahoma City oil field, and on a seismograph crew in the Mid-Continent area.

F. L. Lively, assistant superintendent at New Iberia, La., for Humble Oil & Refining Co., has been transferred in the same capacity to Brookhaven, Miss.

Emilio Montane, Argentine petroleum engineer who resigned recently from an executive position with Yacimientos Petroliferos Fiscales (Argentine Government Oilfields) to engage in private consulting and appraisal practice in Buenos Aires, has been chosen president of the Argentine Section of the South American Petroleum Institute. He succeeds **Mario Villa** whose term expired.

J. H. Todd, superintendent of the geophysics division for the California Co., New Orleans, has been named superintendent of the southern exploration division. Other changes in the company include: **J. A. Harris,** superintendent of the Mid-Continent division, named to replace Todd as superintendent; **C. C. Denny,** district geologist, Mississippi and Southwest Alabama district, transferred to the staff of the chief development geologist, New Orleans; **E. S. Godwin-Austen,** named assistant division landman, Denver; **T. C. Nugent,** superintendent of land and lease division, named manager of the land and lease division, New Orleans; **L. I. Brown,** superintendent of southern exploration division, named assistant general manager of the exploration department, New Orleans; **L. S. Gray,** operator, Craig district, transferred to the Rangely plant; **S. L. Johnston,** shift foreman, named maintenance foreman, Craig district, Rangely; and **B. L. Mishler,** gang pusher, Rangely, named assistant field foreman, Wilson Creek, Craig district.

Laurence Andrew, whose appointment as manager of the pipe-line department of General Petroleum Corp. was announced in January, has taken over his new assignment, and **V. C. Larsen,** assistant general superintendent, has assumed duties as general superintendent, succeeding Andrew. Joining the company in 1912, Andrew has spent his entire period of company service in the pipe-line department, serving for the most part as general superintendent. Larsen joined the firm in 1919. In 1940 he was named northern division manager.

L. ANDREW

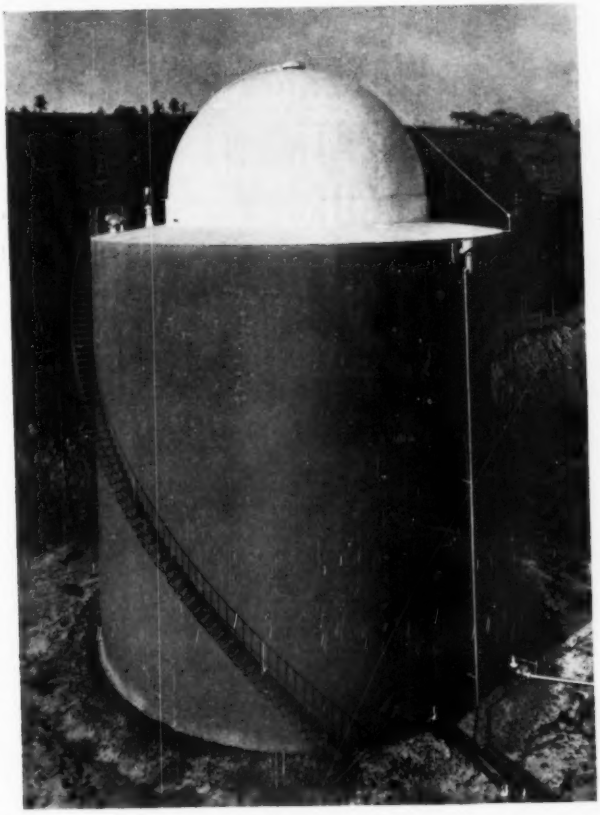
V. C. LARSEN

R. Burnell Bennett, Humble Oil & Refining Co., Baytown, Tex., has been elected president of the Baytown Society of Professional Chemists and Engineers.

T. H. Marshall, vice president of Anderson-Prichard Oil Corp., has been elected chairman of the oil and gas division, Oklahoma City Chamber of Commerce. **Richard Hicklin,** Carter Oil Co., and **Frank C. Love,** Kerr-McGee Oil Industries, Inc., were elected vice chairmen.

George H. Rainey, geologist for Mid-Continent Petroleum Corp., Tulsa, has been transferred to Oklahoma City as head of the exploration department. **M. H. Benson,** Tulsa geologist, has been transferred to Seminole, Okla., in that capacity.

Vapordome Roof Reduces Storage Losses 37% at Worcester



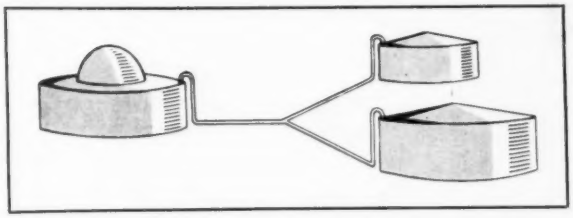
The Vapordome Roof saves money by reducing evaporation losses from standing storage tanks. A 17,000-bbl. tank with a Vapordome roof at the Socony-Vacuum Oil Company's Worcester, Mass., terminal is a typical example. It is used to store Mobilgas Special and, based on the limited data available in the short time in service (since March, 1949), the percentage of storage loss has been reduced from .30 to .19. That's a 37 per cent saving.

The Vapordome Roof at Worcester does more than reduce the loss of some of the Mobilgas in the tank. By reducing evaporation loss, it also helps to maintain the quality of the gasoline. The excessive loss of light components, by evaporation, often robs a gasoline of easy-starting and anti-knock properties so essential in today's high-compression engines.

Here's how the Horton Vapordome Roof operates. A flexible hemispherical membrane is attached, by its outer edge, to the spring line of the Vapordome. This membrane allows the air-vapor mixture in the tank to expand and contract, when the temperature changes, without being vented and lost.

Bulletin D gives you complete engineering data about the Vapordome Roof. Write our nearest office for your copy.

The operating manager of the Socony-Vacuum terminal at Worcester, Mass., says "It is planned to connect other gasoline tanks to the Vapordome tank by means of vapor lines to take full advantage of the potential storage loss reduction offered . . ." This quotation illustrates an important point—the Vapordome can serve a single tank or it can be the central unit of a vapor-saving system consisting of several tanks. The sketch at the right shows how it is done.



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Chicago, 4.....2128 McCormick Bldg.
Cleveland, 15.....2204 Guildhall Bldg.
Detroit, 26.....1514 Lafayette Bldg.
Havana.....402 Abreu Bldg.
Houston, 2.....2119 National Standard Bldg.
Los Angeles, 14.....1523 General Petroleum Bldg.
New York, 6.....3347—165 Broadway Bldg.
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THE *Nalco* SYSTEM . . . Serving Industry through Practical Applied Science

Dr. Roland F. Beers, Dr. Shepard W. Lowman, William B. Heroy, and **Isaac Arnold,** widely known oil scientists, are serving as the nucleus of Rensselaer Polytechnic Institute's newly organized Department of Fuel Research. Dr. Beers will head the department, and Dr. Lowman will serve as full-time professor of petroleum geology, while Heroy and Arnold will serve as guest lecturers. Dr. Beers is president of the Geotechnical Corp., and a partner in the consulting firm of Beers & Heroy. Heroy is vice president of Geotechemical Corp. Dr. Lowman formerly was with the research department of Shell Oil Co., and Arnold is vice president of Quintana Petroleum Corp., Houston.

DR. S. LOWMAN

DR. R. F. BEERS

ISAAC ARNOLD

W. B. HEROY

Dean E. Pittenger, president, Dow Dewey Oil Co., Wichita, has been elected 1950 chairman of the Kansas Oil Industry Information Committee, succeeding **Julius T. Groene,** Southwest Grease & Oil Co.

Allen S. Shepherd, Jr., district petroleum engineer at Avola, Tex., for Humble Oil & Refining Co., has been assigned to the division office at Wichita Falls, Tex.

Russell Hosselton, formerly roustabout for Phillips Petroleum Co. at Clay City, Ill., has been assigned as pumper at Blainsville, Ill.

G. Frick Poe, division production superintendent at Houston for Ohio Oil Co., has been appointed general superintendent of the production department, and transferred to Findlay, Ohio. He succeeds **Fred E. Smith,** who was recently named assistant manager of the company's production department. **O. V. Henry,** Casper, Wyo., division superintendent, succeeds Poe at Houston; **M. J. Boyce,** district superintendent for Montana and northern Wyoming, succeeds Henry at Casper; and **R. E. Knipe,** division geologist at Terre Haute, Ind., has been appointed Casper division geologist. **C. W. Donnelly,** geologist in the Terre Haute division, has been named division geologist of that division.

Charles R. Criss, petroleum engineer for Sohio Petroleum Co. at Evansville, Ind., has been transferred to Oklahoma City in the same capacity.

Paul J. Harrington has been appointed assistant chief engineer in the engineering department of Standard Oil Development Co., succeeding **N. F. Myers,** who has been elected a director of Anglo-American Oil Co., Ltd. Harrington is a graduate of Notre Dame University and received his M.S. degree from Massachusetts Institute of Technology in 1927. He joined what is now Esso Standard Oil Co. in 1929, and in 1936 transferred to Standard Oil Development Co.

P. J. HARRINGTON

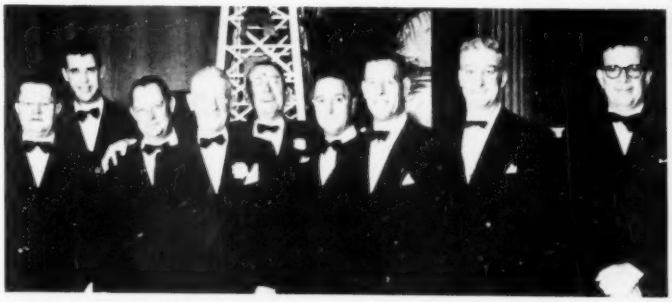
Dr. Robert R. Wheeler, geologist, and **J. N. Ingraham,** landman and oil operator, both formerly with the C. P. Burton Interests in Dallas, have formed a partnership and will operate in Dallas, with headquarters in the Continental Building.

Dollie Radler Hall, one of the few women petroleum geologists, has resigned from Amerada Petroleum Corp., and is engaging in consulting work, with offices in Tulsa. Starting with Amerada immediately after graduating from the University of Oklahoma in 1921, Mrs. Hall is widely known among both geologists and oil operators. She has served at various times with Amerada as exploration geologist, division geologist, and administrative geologist. She is an active member of the American Association of Petroleum Geologists and the Tulsa Geological Society.

DOLLIE HALL

E. K. Hartzell, assistant to the president of Cities Service Gas Co., Wichita, has been elected a director of the company. **B. C. Adams, Jr.,** a director, Oklahoma City, has resigned to become production and purchase superintendent of Trunkling Gas Supply Co., affiliate of Panhandle Eastern Pipe Line Co.

Clarence L. Moody, Ohio Oil Co., Shreveport, has been elected by mail ballot as president of the American Association of Petroleum Geologists for 1950-51. He will take over his new duties at the annual meeting in Chicago in April. Others elected include: **John Emery Adams,** Standard Oil Co. of Texas, Midland, vice president; **Henry N. Toler,** Southern Natural Gas Co., Jackson, reelected secretary-



NEW HOUSTON NOMADS OFFICERS.—Shown above are the new officers of the Houston Chapter of Nomads, who were elected January 9 and installed recently at a dinner-dance held at the Shamrock Hotel. Left to right: regent, C. B. McDonald, A-1 Bit & Tool Co.; sergeant-at-arms, Lawrence J. Kelley, Hillman-Kelley; vice president, Wayne Rives, The Oil and Gas Journal; president, Edmond L. Lorehn, Cameron Iron Works; deputy sergeant-at-arms, C. F. (Bud) Vincent, Byron Jackson Co.; assistant secretary-treasurer, E. F. (Salty) Baldwin, Hughes Tool Co.; regent, E. M. Fontaine, National Tank Co.; secretary-treasurer, Tracey T. Word, Jr., Well Equipment Manufacturing Corp.; executive secretary, H. E. Estes, A-1 Bit & Tool Co.

PERSONALS

TULSA N.A.C.E. OFFICERS.—Above are the new officers of the Tulsa Chapter, National Association of Corrosion Engineers. Left to right: Prof. Franklin T. Gardner, University of Tulsa, chairman; F. E. Pyeatt, Jr., Mid-Continent Pipe Line Co., vice chairman; and Frank McNulty, Pittsburgh Coke & Chemical Co., secretary-treasurer.

treasurer; and **Alfred H. Bell,** Illinois State Geological Survey, Urbana, re-elected editor.

Howard E. Fish, district production and drilling superintendent for Sunray Oil Corp. at Premont, Tex., has been transferred in the same capacity to the Yorktown, Tex., district.

R. C. Stoner, veteran geologist, has retired as vice president and director of Standard Oil Co. of California, after more than 36 years of service. Stoner joined the company in 1913 and served as exploration and development geologist in California. After 2 years as geologist in the Rocky Mountain area, he went to Mexico in 1921 to take charge of exploration activities. He remained until 1924, when he returned to San Francisco. From 1925 to 1931 he served as assistant general manager of the producing department, and was named general manager in 1931. In 1938 he was elected a director of the company.

Floyd L. Stewart, development engineer for Richmond Exploration Co. at Maracaibo, Venezuela, has returned to the United States and is now serving as petroleum engineer for Hancock Oil Co. of California, Long Beach.

Ernest R. Love, who recently resigned as a vice president and director of Camay Drilling Co., has joined Stansbury, Inc., of Bakersfield, Calif., as general superintendent in charge of drilling.

Robert E. Kepke, vice president of British American Oil Co., Ltd., Toronto, Ont., recently accompanied a group of Canadian oil and financial writers to Oklahoma, Kansas, Texas, and Wyoming, for a first-hand view of the company's operations. **C. D. Miller,** executive vice president of British-American Oil Producing Co.; **J. J. Arps,** manager of production research and economics; and **W. E. Schoeneck,** vice president of production, all of Tulsa, also assisted in entertaining the newsmen.

W. L. Smith has been named group leader in the coordination and economic department of Pan American Refining Corp.'s Texas City, Tex., refinery. Other appointments include: **Dr. L. M. Adams** and **J. A. Grant,** named group leaders in the chemical-research service; **Dr. H. D. Radford,** appointed group leader in the exploratory-research section; **R. C. Tate,** named process foreman, light-oils department; **R. G. Weist,** named group leader in the research and development department; and **R. K. Trahan,** appointed shift supervisor in the control-testing division.

James J. Williams, petroleum engineer at Bartlesville, Okla., for Cities Service Oil Co., has been transferred to Great Bend, Kans., as production engineer.

Richard Rector and **James Montgomery,** geologists, have been assigned to Magnolia Petroleum Co.'s West Texas district office at Midland, under **H. A. Hemphill,** district geologist. **Wayne R. Hammond,** formerly at Midland, has been transferred to the general offices in Dallas as an assistant to **Ed Cram,** coordinator of geological and production work, and **John L. Townley, III,** also formerly on the Midland geological staff, has been given a temporary assignment to do special work for Socony-Vacuum Oil Co., Inc., in Calgary, Alta., Canada.

Hobart G. Mariner, whose appointment as superintendent of the Missouri division of Stanolind Pipe Line Co. was announced last week, has assumed his new duties, replacing **E. W. Young,** who retired recently. Mariner joined the company in 1940.

H. G. MARINER

James H. Heslar has been appointed superintendent of construction and maintenance at Pure Oil Co.'s Smiths Bluff refinery, and **Joseph B. Price** has been named superintendent of the lube and grease division. Heslar has been with Pure since 1917, and Price joined the company 26 years ago.

B. J. Brown, petroleum engineer for Mid-Continent Petroleum Corp. at Seminole, Okla., has been transferred in the same capacity to Midland, Tex.

DEATHS

Louis Olsan, 65, Dallas oil man, died in Miami, Fla., February 4.

Cornelius J. Gaffney, foreman at Tide Water Associated Oil Co.'s Bayonne, N. J., refinery, died January 27.

Worth Garetson, 57, Medicine Bow, Wyo., drilling contractor, was killed in an automobile accident near Casper January 28.

A. G. Eberts, 75, geologist for Sun Oil Co., and formerly for The Texas Co., died January 29 in Beaumont, Tex.

Frank J. Kearney, 76, retired chief clerk for Sinclair Refining Co., Fort Worth, died in Houston January 30.

Kenneth W. Hagen, 55, scout for Mid-Continent Petroleum Corp. in the Central Oklahoma area, died in Okmulgee, Okla., January 31.

H. L. Applegate, 67, Pittsburgh, retired assistant to the president of Carnegie Natural Gas Co. and Apollo Gas Co., died February 2.

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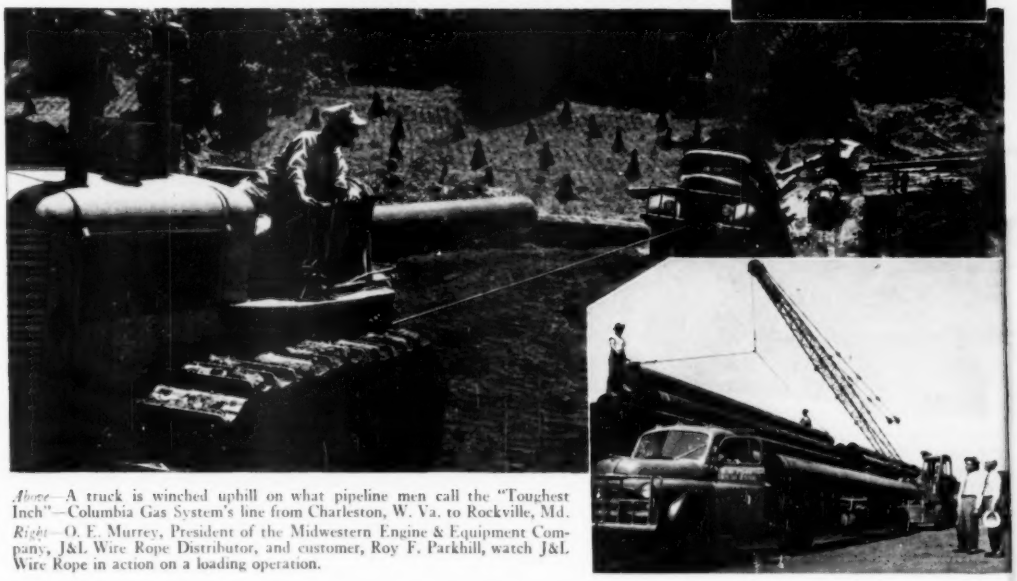

Above—A truck is winched uphill on what pipeline men call the "Toughest Inch"—Columbia Gas System's line from Charleston, W. Va. to Rockville, Md. *Right*—O. E. Murrey, President of the Midwestern Engine & Equipment Company, J&L Wire Rope Distributor, and customer, Roy F. Parkhill, watch J&L Wire Rope in action on a loading operation.

Roy F. Parkhill Uses J&L Wire Rope Exclusively for Greater Profits and Safety on Rugged Operations

Stringing pipe requires strong men, and tough wire rope. Working seven days a week through heat and cold and over every conceivable kind of terrain in all parts of the country pipe stringing crews wage a continuous battle against time. Their ability to push the job through *fast* controls the margin of profit.

Roy F. Parkhill knows how downtime cuts into profits. That's why he uses J&L Wire Rope exclusively for all his equipment.

A pipe stringing operation moves on wire rope. Wire rope loads and unloads pipe. It moves the pipe by dragging loaded trucks through swamps, muck and over steep hills. To do the job, Mr. Parkhill has selected J&L Wire Rope because he knows it gives him longer service life and greater strength. That means dollars saved through less downtime —less rope used—and greater safety.

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Above: Loaded with pipe and equipment for its first hole, the Rex prepares to leave New Orleans for the Morgan City area. Note the H-frame which supports the 127-ft. cantilever derrick. Williams Drilling Co.'s new barge is capable of drilling to 8,000 ft. with 4½-in. drill pipe.

Right: The draw works and pumps are powered by these three gasoline engines developing a total of 600 hp.

Left: A radio-telephone in the crew quarters provides communication at all times with shore headquarters as well as other marine vessels. The 30-ft. tool pusher's launch is also equipped with radio-telephone.

WILLIAMS DRILLING CO.'S NEW

8,000-Ft. Submersible Drilling Barge

Features a 127-Ft. cantilever derrick

by Leigh S. McCaslin, Jr.

WILLIAMS DRILLING CO., of Baton Rouge, La., has drilled its initial hole with a new 8,000-ft. submersible drilling barge which features a 127-ft. cantilever derrick. The well was drilled for Shell Oil Co. in West Lake Verret field of St. Martin Parish, Louisiana.

The well-designed workover and drilling barge is one of four rigs now being operated by Williams in Louisiana, North Texas, and South Arkansas. The company is a partnership which was formed by W. W. (Bill) and Wilson H. Williams in 1944. At the time of organization, the two partners had one rotary workover and shallow drilling rig. A second rig was purchased in 1946, a third in 1947, and a fourth in 1948. One of these rigs was installed on the new barge which has just finished its first hole. Tool pushers for the concern are Jack Dean, Joe Alexander, D. Crouch, and John (Cowboy) Warren.

Williams new submersible barge is all welded and 130 ft. long by 36 ft. wide by 11 ft. high. The drilling slot is 8 ft. wide by 65 ft. long. The hull is divided into six ballast compartments and four fresh-water compartments. It is constructed of $^{3}/_{8}$-in. bottom and $^{5}/_{16}$-in. side and deck plate. The barge draws 4-5 ft. of water when floating. Builtin on the front end are two heavy-duty spud posts 29 ft. long and 17 by 17 in. square, each with hoists.

The two mud pumps are on a pump deck constructed 5 ft. above the main barge deck. The tanks have a capacity of 500 bbl. All suction and discharge lines are accessible and in open view to facilitate repairs. The pump deck also houses water pump, light plants, mud house, hopper, and mud guns. The floor of the pump deck is flush with the top of the mud tanks. A removable floor connects pump deck over slot area, and is removed if an unusually high christmas tree is installed.

Draw Works on Floor Deck

The draw works is on the floor deck which is 54 ft. long and 36 ft. wide. The floor deck is 16 ft. above the bare deck and 11 ft. above the pump deck. From the bottom of the rotary to the deck of the barge is 15 ft., which provides space for a master valve and two blowout preventers. The cellar span across the top of the slot and between the substructure is $11\frac{1}{2}$ ft. The floor deck, as well as the pump deck, is made of $^{1}/_{4}$-in. nonskid checkered plate-steel flooring.

The floor deck house contains draw works, tool room, tool and work benches, and crew quarters. The living quarters are constructed of interlocking steel walls insulated with rock wool. Pipe racks are forward of the floor on the barge deck and connected by a ramp and stairway to the floor. The fuel tanks are forward of the pipe racks on the barge deck.

An H-frame on the forward end of the barge supports the 127-ft. cantilever derrick when it is not in use. The derrick can be lowered and raised in a matter of minutes. It has a design capacity of 450,000 lb. A special reinforcement has been attached to the derrick at the point where it rests on the H-frame.

A radio-telephone provides communication at all times with shore headquarters as well as other marine vessels. A 30-ft. launch services the barge and provides transportation for the tool pusher. It is also equipped with radio-telephone.

Alexander Shipyard, Inc., of New Orleans, designed, engineered, and constructed the new barge. Joe Alexander is the tool pusher of the rig for Williams Drilling Co.

Equipment List

A detailed list of the equipment on the barge follows:

Brewster Model N6 draw works with American Simplomatic cathead and Foster Junior spinning cathead, 36-in hydromatic brake, powered by three 6WAKU Waukesha engines developing a total of 600 hp. for draw works and pump drive.

$7^{1}/_{4}$ by 14 Gardner-Denver slush pump.

$7^{1}/_{4}$ by 10 Gardner-Denver slush pump with WAK Waukesha engine. Cameron pressure-operated blowout preventer and master valve.

Three separate light-plant units.

Emsco OB-27 rotary.

Rig-A-Lite system.

Brewster Model R-5-36 traveling block with sheaves ground for $1^{1}/_{8}$-in. line. 250-ton capacity.

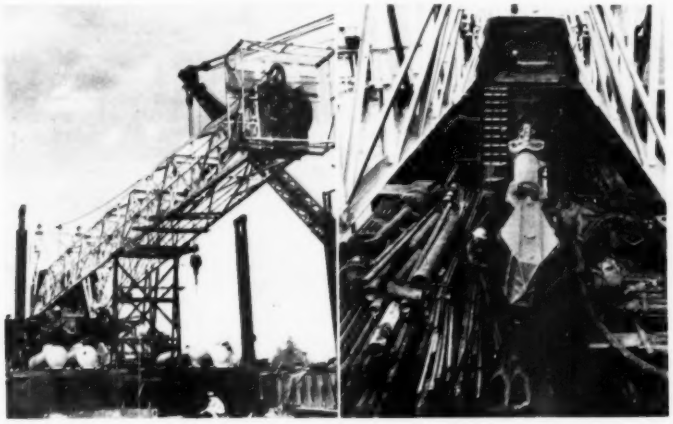
Cameron QRC blowout preventer, Cameron SDA blowout preventer, Cameron SDA master valve, Hinderliter stripper.

Brewster Model 6-S swivel, 250 tons.

BJ hook, Series 4200, 200 tons.

3 by 41-in. square kelly, Type C Web Wilson tongs, steel drilling hose, Martin-Decker weight indicator, Baash-Ross kelly cock, 3-in. centrifugal pump with Chrysler motor, 2-in. centrifugal pump, $1^{1}/_{2}$-in. centrifugal pump, 4 by 6 Wilson-Snyder water pump.

127-ft. Lee C. Moore cantilever derrick with 15-ft. substructure, 450,000 lb. capacity.



Left: Here, the cantilever-type derrick on new drilling unit is laid down. Right: Drill pipe and block, laid down, are near barge slot.

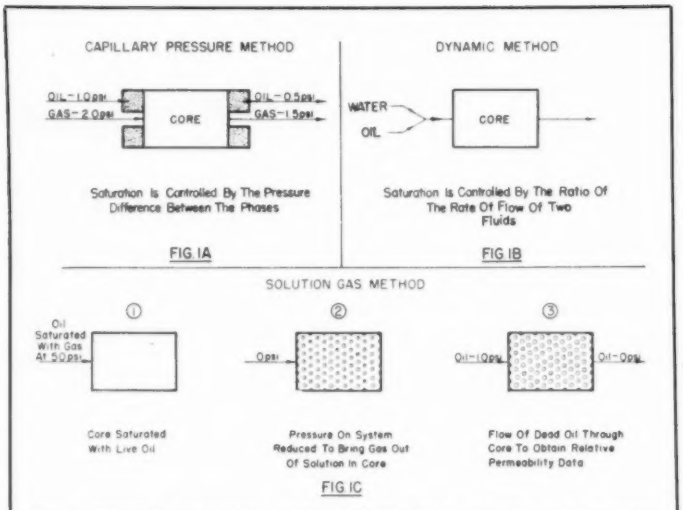


Fig. 1—Schematic representation of the principal methods of control used in relative permeability determinations

Laboratory Determination of

Relative Permeability

by E. R. Brownscombe,* R. L. Slobod,* and B. H. Caudle*

PART 1

RELATIVE permeabilities are fundamental for the analysis of reservoir problems concerning the effect of various production procedures on recoveries. They are needed for any analysis of natural depletion, natural water drives, water flood, gas injection, or gravitational drainage. There are many difficulties, such as the effects of changes in fluid properties at reservoir conditions and of inhomogeneities in the reservoir medium which must be worked out before laboratory measured permeabilities can be used at face value for field calculations. This paper will be confined to: (1) The probable effect of the desaturating mechanism on the observed relative permeability; (2) the reference value used to define the relative permeability ratio, and (3) a description of a capillary-pressure-type relative-permeability apparatus and a discussion of some of the data obtained.

*Atlantic Refining Co., Dallas.

Effect of Displacement Mechanism

From the earlier work in this field [2,3,4] the marked dependence of relative permeability on saturation is readily apparent. The results of more recent studies suggest that the location or, more particularly, spatial distribution of the phases within the porous system, determines to a great extent the ability of a particular phase to flow.

It is conceivable and highly probable that the spatial distribution of a second phase entering the capillary system will depend upon the mechanism used for its introduction. On the basis of the above, it is strongly suggestive that the method used to introduce a second phase into a core specimen may have an appreciable effect on the observed relative permeability of the resulting system at a given saturation. Three important mechanisms involving the displacement of one fluid by another are readily apparent. It is suggested that these be referred to as capillary-pressure displacement, dynamic displacement, and solution-gas displacement. Some discussion of this concept has already appeared in the literature.[5]

Capillary pressure displacement.—This method of displacement, described by many in the literature[6], is characterized by pressure difference between the phases, made possible by the use of porous diaphragms which under the conditions of the experiment are permeable to only one of the fluids present in the system, as shown in Fig. 1 A. In the usual application the core specimen, 100 per cent saturated with a single phase, is placed in capillary contact with the porous diaphragms saturated with the same liquid as the core. Use of this desaturation method for relative permeability measurement has been described by Hassler[1].

In the authors' application of the method the core, in position between the diaphragms and sealed along the sides, is placed in contact with a second fluid, the displacing phase, through openings in the porous diaphragms. When pressure above that acting on the wetting phase is applied to the displacing phase, a controlled pressure difference between the phases is generated, and displacement occurs.

The displaced liquid flows from the core through the porous diaphragms while the displacing fluid is retained in the system as long as the applied pressure difference between the phases does not exceed the displacement pressure of the diaphragm. The rate of change in the saturation of the displaced liquid decreases to zero as equilibrium is approached.

As shown in Fig. 1 A, the pressures acting upon the phases at both ends of the core are adjusted so that a uniform pressure difference between the phases exists through the length of the core with a uniform pressure drop across the core in each phase to produce a fluid flow. The main variables (omitting core properties) operating in this system are pressure differences between phases and interfacial tension.

Dynamic displacement.—This mechanism has been used by earlier workers in the field[2,4] and is shown schematically in Fig. 1 B. This method of displacement is characterized by the maintenance of a flow of one or more fluids through the core sample to establish a steady-state equilibrium, flow being maintained after equilibrium is established.

To accomplish such a displacement the core is confined in a rubber sleeve, a plastic jacket, or some similar device while the displacing fluid is forced through the core under either a constant pressure head or at constant rate. The saturation within the core adjusts itself in response to the pressure difference between the phases generated as a result of the imposed flow conditions. At equilib-

rium the saturation distribution within the core becomes fixed, but flow must be continued to maintain this steady-state equilibrium.

In dynamic displacement an interface between the displacing and the displaced phase exists which normally travels through the core in a more or less piston-like manner moving the major portion of the material to be displaced ahead of the interface. After the interface passes a point in the system, displacement from this point continues at a slower rate until the saturation is consistent with the pressure difference between the phases generated by the flowing phases and secondary effects possibly related to the rate of flow. Some of the variables in this system (omitting core properties) are ratio of phases flowing, pressure gradient, and viscosity.

Solution - gas displacement. — This term, in common use in the industry, is used in this paper to conform with general usage. Thus, the displacement of a liquid phase by the gas evolved within the pore spaces of the core as a result of dropping the pressure of the system below the bubble point of the liquid containing the dissolved gas represents a solution gas displacement.

As shown schematically in Fig. 1 C, oil previously saturated with gas at a predetermined pressure is placed in the core. The pressure is then dropped to atmospheric, resulting in a certain gas saturation. A very small amount of dead oil is then flowed through the core to determine the relative permeability of the core to oil at this gas saturation. Measurements are usually made between zero gas saturation and critical gas saturation, the latter value being readily determined. The main variable here (omitting core properties) is the volume of evolved gas.

Application to Field Performance

An examination of the fluid distributions within a porous system resulting from the use of capillary pressure, dynamic, or solution - gas displacement helps explain the dependence of relative permeability on the spatial configuration as well as the saturation of the phases within the core. In the capillary-pressure desaturation of a core the first liquid displaced comes from the largest connected openings, and for each value of the applied pressure difference between phases the liquid in all non-isolated openings larger than that possessing a capillary pressure equal to the applied pressure is displaced, assuming the wetting phase to be continuous. Since these larger capillary flow channels contribute most of the flow passages responsible for permeability of the core, blockage of flow by the entrance of a second phase in these larger openings results in a marked decrease in the relative permeability.

The dynamic displacement mechanism yields somewhat similar results since pressure difference between the phases generated by the imposed flow conditions acts to displace the liquid from the larger openings first. As a result of the movement of an interface through the core and because of the presence of pressure gradients across the core, however, the final distribution of the phases is probably somewhat different from that established by capillary - pressure difference alone. Consequently, the relative-permeability decrease with saturation change should reflect these differences when compared with results obtained by the capillary pressure method.

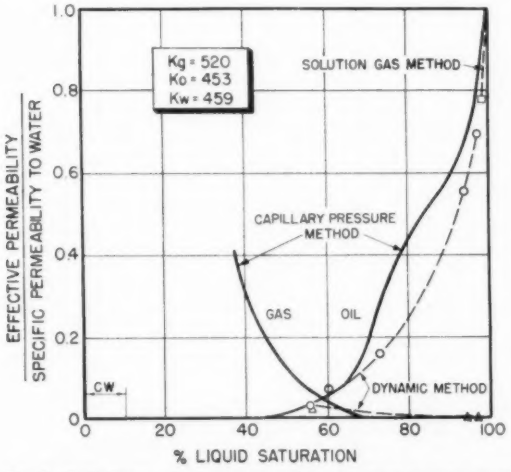
The solution-gas displacement, on the other hand, should give a very different result. Since gas may come out of solution throughout the system, the first fluid displaced by the gas comes from all parts of the porous system, not from only the larger capillaries. This behavior should mean that the relative permeability of the displaced phase will not decrease as rapidly with desaturation as in the previously mentioned methods. At the present time only a few relative permeability determinations have been made by all three of these methods on the same core samples.

Fig. 2 shows data on an individual specimen obtained with the three different methods. In each case oil and gas were the flowing phases with connate water present as a static phase. The differences observed in the oil curves obtained by the capillary pressure and dynamic methods are typical of the similar comparisons which have so far been made. The curve obtained by the dynamic method falls under the one obtained by the capillary-pressure method until a saturation value close to the cross-over point of the oil and gas curves is then reached where the two curves coincide. These data show very little difference between the oil-permeability curves obtained by the capillary-pressure and solution-gas method.

Fig. 3 presents similar data for capillary - pressure and solution - gas methods in which the resulting oil-permeability curves were widely different. In general, it appears that the more permeable the core, the less difference there will be between these two methods.

In the application of experimental curves it seems reasonable that the different methods should be used to correspond to different types of problems being studied in the reservoir. For example, the capillary-pressure-

(Continued on page 81)



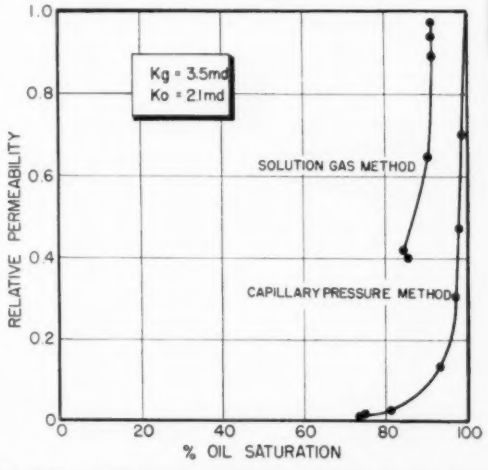


Fig. 2—(Left) Curves of relative permeability obtained by using capillary pressure, dynamic, and solution-gas displacement. CW represents connate water present in each case. Fig. 3—(Right) Large differences are obtained with different methods on a tight core. The core sample was a Devonian lime from West Texas

THREE-DIAMETER RADIUS 90° ELBOW.—On new Goleta, Calif., 20-in. loop of Southern Counties Gas Co. Left to right are: G. K. Shick, in charge of Project No. 2; L. E. Conway, project superintendent; C. O. Anderson, staff assistant

New Long-Radius Elbow Features Goleta 20-In. Line

OUTSTANDING construction feature of the northern section or loop of the 1950 Goleta, California, 20-in. pipe line, now nearing completion, is the development of a new, long-radius elbow. The new long-radius "ell" will greatly facilitate pipe-line cleaning operations with line scrapers or "pigs" as they are more commonly known.

Heretofore, in running a scraper through a pipe line, it has been necessary to increase line pressure to force the pig or "go-devil" through the sharp bend of a regular pipe-line elbow. This made it difficult to control the velocity of the scraper, which would block at a turn and then scoot off too rapidly under the increased pressure, once it had cleared.

To solve this problem, C. F. Briscoe, manager of engineering services for Southern Counties Gas Co., conceived the idea of a sweeping, extra-long-radius ell, and Ladish Co. was requested to develop the idea for use in the 1950 Goleta pipe line.

The new, extra-long-radius ell has a three-diameter radius as compared to the one and one-half-diameter radius of former long-radius ells. This means that for a 20-in.-diameter pipe line such as the Goleta, the newly developed ell has a 60-in. radius compared to 30 in. of the previous so-called long-radius ell.

In fabricating the new elbow, Ladish used Corten steel, a development of U. S. Steel Corp. The greater physical strength of this steel makes possible fabrication from thinner-walled tubes than the seamless grade "B" formerly used.

A consequent second advantage of the newly developed ell is that it can be cut into segments which can be welded into the pipe line at any point. This is made possible as the outside diameter of the new type elbow is held accurately within $\frac{1}{8}$-in. throughout its entire length. When attached to the pipe the segments form a smooth joint which is not possible if the outside diameter of the elbow is not true.

Prior to putting the new line into operation, it will be given an interior cleaning and polishing.

The two 20-in. Goleta pipe-line loops will increase delivery capacity of the line by 40 million cubic feet a day. Eventually, however, the 20-in. loops will become part of an entirely separate 20-in. pipe line extending from Goleta to Los Angeles.

TWO 45° SEGMENTED SECTIONS.—On 20-in. Goleta gas pipe line loop. Left to right are: L. E. Conway, project superintendent; Jack Cook, contractor's superintendent; T. N. Banks, in charge of Project No. 1

View of Goleta 20-in. line taken during construction at E. W. Ormsby Ranch

POWER FACTOR CORRECTION

on a pumping lease

by E. H. Lamberger*
and R. A. Swindell†

THE power factor of an oil-well pumping load is inherently poor because of the use of induction motors and the cycle nature of the load. This results in currents which are higher than needed for the useful power requirements and disadvantageous from the standpoint of line drop and power costs. Improving the power factor minimizes current demands and improves voltage conditions at the motor.

Explanation of Load Power Factor

The power factor of a machine is the ratio of the power current to the total line current. The line current is composed of the magnetizing current and the power current. The magnetizing current component, while indispensable, is not directly useful when calculating the kilowatt or horsepower load represented by the line current.

The source of poor power factor is in the motor load and not in the power-supplying equipment, but this equipment must carry the line current at load power factor. Power-factor correction consists of supplying, in effect, the magnetizing current required by the motors, by means external to the generator. The means usually used in the oil fields is the capacitor. The capacitor, of course, also draws current from the generator, but this is a "leading" current and counteracts the "lagging" magnetizing current of the load.

The leading current is negative relative to the lagging current so, if numerically equal, their algebraic sum is zero. In effect, therefore, the generator is relieved of carrying the magnetizing current of the motors, and its full current capacity is available to perform work—kw. or hp. load. The corrosive effect of the capacitors is illustrated by Fig. 1. It is apparent that the power factor would be 100 per cent when capacitors supply the full magnetizing current. Any additional capacitance would cause overcorrection, resulting in a leading power factor of a value less than 100 per cent.

*Industry engineering department, Westinghouse Electric Corp., East Pittsburgh
†Industrial division, Westinghouse Electric Corp., Dallas

Effect of Power Factor Improvement

If a given kw. or hp. load is carried by a generator at 100 per cent power factor, the load current is a minimum, and the permissible kw. load (volts × amperes × 1.73 × 1.00 PF/1,000) numerically equals the kva. load (volts × amperes × 1.73/1,000). For any power factor lower than 100 per cent, the current and kva. are inversely greater.

For example, a 50 per cent power factor would impose a current and kva. load on the generator twice the minimum possible for the kw. or hp. load carried. The installed kva. rating of the generator must therefore be double the kw. load carried, or for a given installed kva. the permissible kw. load would be numerically one-half the kva. rating.

The load-carrying ability of the generator (at any given voltage) is determined by the current rating of the generator. The load current must not exceed the rated current, regardless of power-factor value—or load kva. must not exceed rated kva. regardless of power factor.

Area of Effectiveness of Capacitor Correction

The capacitors may be installed at the power source which may be the lease generating plant or the main transformer bank, at various points in the lease distribution system, or at the motors. The corrective action of the capacitors is effective from the point of their application to the ultimate generator, as illustrated by Fig. 2. Therefore, to improve load conditions throughout the distribution system on the lease, the capacitors must be located at the motors.

When so located they improve voltage conditions of the motor, and reduce power loss in the lines, by causing a reduction of the current in

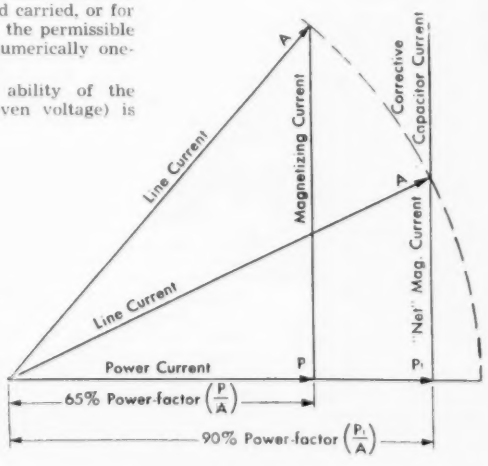


Fig. 1—The "corrective" capacitor current, by reducing the magnetizing current to the lower net value, permits the line current A to increase its effectiveness in carrying a working load from 65 to 90 per cent.

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Goodall is the first manufacturer of rotary hose to successfully develop a cord carcass to replace the canvas duck carcass that, up to now, has been standard for rotary hose.

This new construction makes Goodall FLEXO *CORD* Rotary Hose as far superior to ordinary rotary hose as cord automobile tires are superior to old-fashioned fabric tires.

Here are some of the reasons why you get greater durability, better performance and longer life from the new Goodall FLEXO *CORD* Rotary Hose. In the first place, the cord carcass has far greater tensile strength than the canvas duck material it replaces. Equally important, it is laid in multiple plies at precisely the correct transverse angles to resist the destructive torsional twist that causes a fabric carcass to cut itself to pieces.

Perfect Balance

Perfect balance — an essential to flexibility, long life and trouble-free performance — is assured by the new Goodall method of winding the multiple cords of the carcass and the steel cables of the pressure element at corresponding angles. This neutralizes the tendency of the hose, under pressure, to elongate and distort. It also results in greater flexibility for easier handling . . . permits the hose to hang evenly in the rig.

Costs No More!

Extensive field tests under severe drilling conditions have proved that the new, improved Goodall FLEXO *CORD* Rotary Hose has what it takes to withstand torsional twist, whipping, jerking, pulsation and rough handling better than any premium hose ever manufactured. It gives you longer service life and better performance — at no additional cost!

Take advantage of these revolutionary new improvements. Next time you order, specify Goodall FLEXO *CORD Rotary Hose!*

To get longer service from your Goodall Rotary Hose, use a swivel joint at each end.

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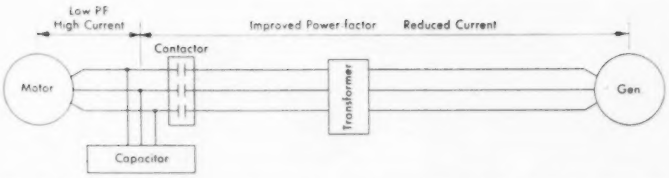


Fig. 2—The capacitor draws its current from the generator and therefore the corrective effect of the capacitor exists from the capacitor to the generator. There is no effect on the circuit from the capacitor towards the motor.

the lines. They do not affect the power factor of the motors. If distribution voltage drop or power losses are not objectionably high, and only improved current conditions of the generator are needed, the capacitors may be grouped in the generator station.

Cause of Low Power Factor

Since motors used for pumping are of the induction type, and frequently have characteristics which produce specially high starting torques, their rated full-load power factors are relatively low. Furthermore, the load of a pumping well is a cyclic one with loads ranging from high peak values, probably well beyond the rating of the motor, down to low values, possibly no load.

The power factor at light loads is low, without corresponding improvement above the full load value at overloads. The cyclic pumping load therefore will have an average power factor which is lower than the rated power-factor value. This is illustrated by Fig. 3, which is taken from an actual test with a normal-slip high-torque pumping motor. It is apparent that lightly loaded motors in a field will tend to lower the over-all power factor of the total load carried by the power station.

Field tests have shown that the average power factor for a complete pumping cycle will approximate 60 per cent for normal-slip, high-torque pumping motors, and 70 per cent for high-slip, high-torque pumping motors, assuming that starting torques for both motors are equal. The power factor of the high-slip motor would be inherently higher, due to a lower magnetizing current in combination with a higher rotor resistance.

The use of an oversized motor, to obtain adequate starting torque or for other reasons, would result in lowering the average power factor considerably, because the average motor load would be low relative to the nameplate rating.

The effect of the power factor of the distribution system, including transformers, on the power factor at the generator may be neglected. The over-all effect of the power factor of the distribution system for a typical lease with 20 motors with ratings ranging from 5 to 20 hp. and including both normal-slip and high-slip motors was calculated to be less than 1 per cent.

Selection of Capacitors for Individual Motors

A safe value of capacitor kva. for use with individual motors may be selected from Table 1. To make the selection of capacitor rating only the nameplate rating of the motor is required. In most cases the kva. value of capacitor indicated by the table will result in a correction of average power factor to approximately 90 per cent.

TABLE 1—MAXIMUM RECOMMENDED RATING OF CAPACITORS

(To be used with 3-phase, 60-cycle oil-well pumping motors)

Motor nameplate rating hp.	Kva. capacitor rating: 4-pole (1,800 r.p.m.) motor	6-pole (1,200 r.p.m.) motor	8-pole (900 r.p.m.) motor
3	2	2.5	3
5	2.5	3	4
7½	3	4	5
10	4	4	5
15	5	5	7.5
20	5	5	7.5
25	7.5	7.5	10
30	10	10	10
40	10	10	12.5
50	12.5	12.5	15
60	15	15	17.5
75	17.5	17.5	20

It should not cause overvoltage at the motor when motor and capacitor are disconnected from the line and equipment comes to a stop, unless considerable overspeeding of motor may occur due to well being unbalanced to an excessive degree. A reliable check is to connect a voltmeter across the motor terminals (with capacitor connected) and observe maximum voltage indication. It should not exceed 110 per cent of the motor rated voltage.

The values of Table 1 are based on the no-load excitation requirements of the motors, rather than the requirements at full load. Individual motor characteristics may permit higher values. This can be determined from the no-load current value of the motor (the kw. component can be neglected usually). A permissible safe value of capacitor kva. rating would be:

$$\frac{\text{N.L. Amp. at Rated Voltage} \times \text{Rated Voltage} \times 1.73}{1{,}000}$$

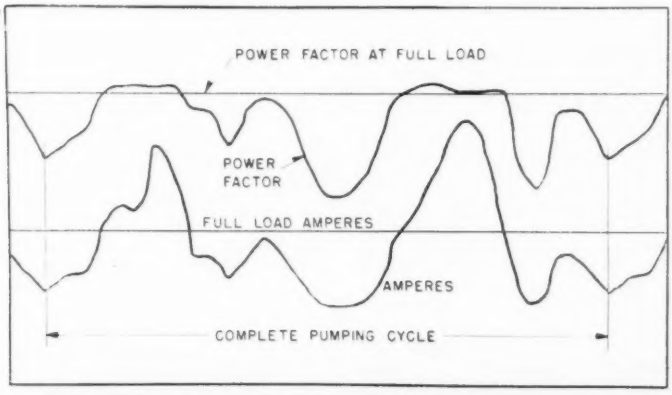
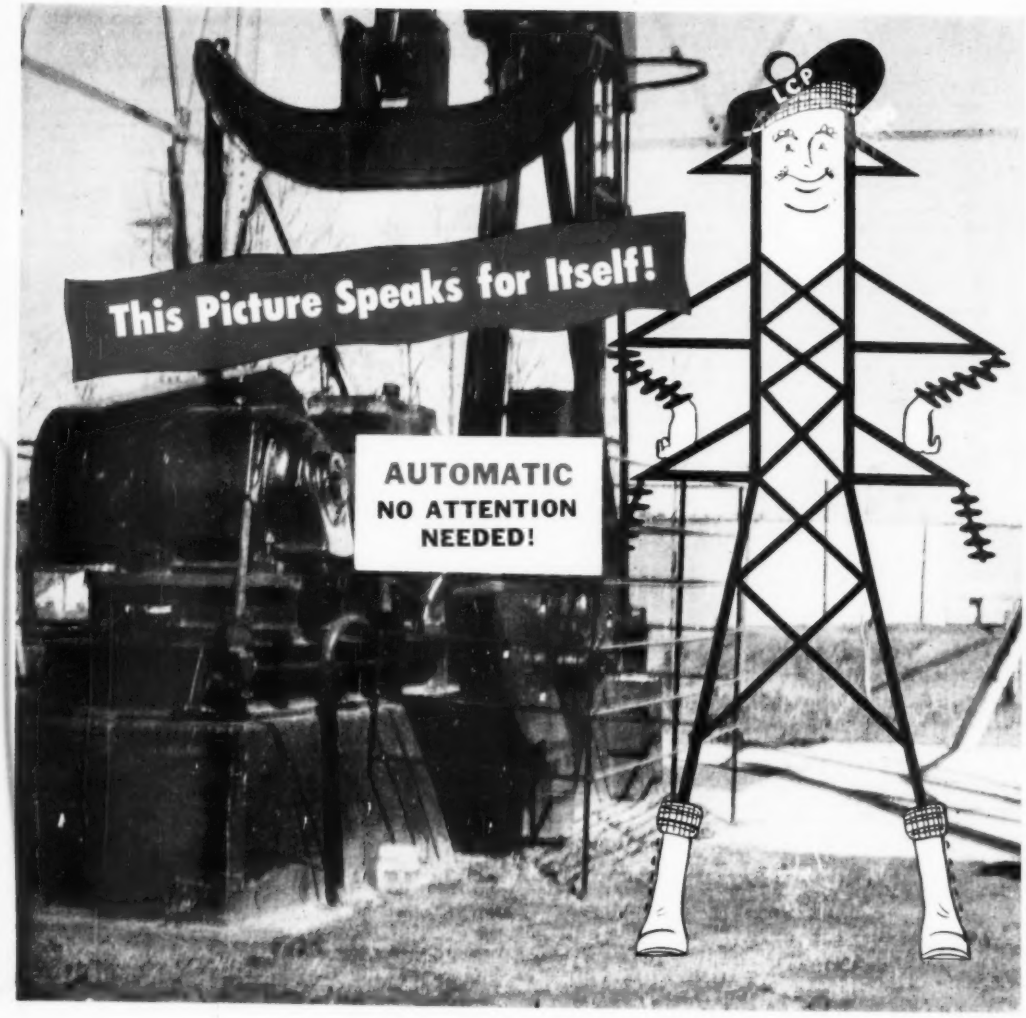


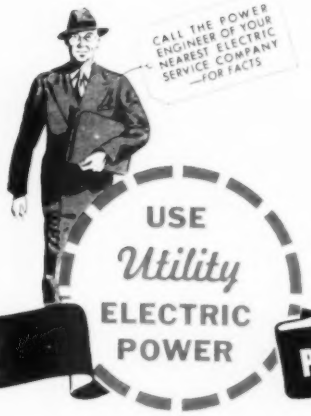
Fig. 3—The improvement in power factor at overloads does not compensate for the low values at lower motor loads. This is an actual record taken from pumping equipment in operation.

The Relation of Power Factor to Generator Ratings

The power factor of the load has a direct bearing on the generator application but has no appreciable effect on the hp. rating of the prime mover. With a required motor hp. load at 65 per cent power factor which represents a 100-kw. load on the generator, three courses are open as to generator selection, namely:

1. A 65 per cent power factor generator may be used with no corrective measures necessary to improve power factor. This generator would have a kva. rating of 100 kw./0.65 = 154 kva. A machine with a standard rating of 156 kva. at 65 per cent power factor would be selected. An engine with a conservative continu-





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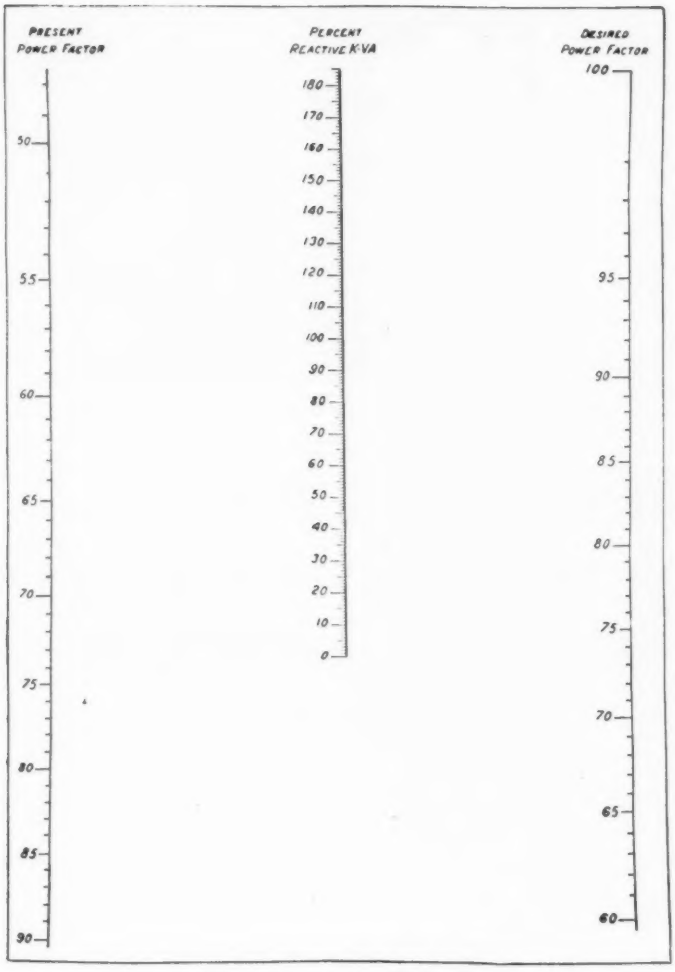

Fig. 4—Capacitor calculation chart.

ous-duty rating of 100 hp. and a momentary peak hp. capacity of possibly 150 per cent of this rating would be required. This generator has a potentially greater kw. capacity.

If the power factor is improved from 65 to 80 per cent, the kw. rating of the generator is increased by the same percentage to (100 kw. × 0.80)/0.65 = 123 kw. With improvement to 100 per cent power factor, a value usually impractical from a cost standpoint, the kw. capacity of the generator would be 154 kw., or the kva. rating and kw. rating become equal. It is evident that increases in well loads or the addition of more wells can be handled by a lower power factor generator if the power factor is raised in the same proportion as the total average hp. load is raised.

It must be noted however, that while the same generator, control, and distribution system (if capacitors are at motors) can be used, the engine loading will be increased directly as the kw. load of the generator is increased.

This would probably mean the replacement of the existing engine with one of greater capacity.

2. A generator rated at 80 per cent power-factor load without power-factor correction. The generator kva. rating selected at 80 per cent power factor must be adequate to carry the 65 per cent power-factor load. The actual kw. value of 65 per cent load which can be carried by the 80 per cent machine is lower than the rated kw. not only by the ratio of 65/80 but by an additional percentage due to the effect of the low power-factor current on the excitation of the machine.

This percentage may be as much as 15 per cent, but a more normal value would be 10 per cent. Thus the kva. rating of the 80 per cent machine must be 100 kw./0.8 × 80/0.65 × 1.0/0.9 = 171. The next larger standard rating would be selected, namely a 187-kva., 80 per cent power-factor machine. In this case as in the first method, a 160-hp. engine would be required.

3. A generator rated at 80 per cent power factor may be selected, on the basis that the load power factor will be raised from 65 to 80 per cent by the use of capacitors. The required kva. rating of the machine would be 100 kw./0.8 = 125 kva.

Cost of Power Factor Correction

For a given value of motor load, the size of the prime mover is not affected by improvement in power factor. This is true except for a reduction in copper losses, which, though it may be important from a power-cost standpoint, probably will not be large enough to affect the size of generator or engine. The principal items of first cost to be considered are the difference in cost of the generator and control, and the cost of the corresponding capacitors required to obtain the improvement in power factor.

In accordance with these examples, a 65 per cent power-factor generator, or an 80 per cent power-factor machine with or without necessary capacitors for power-factor correction from 65 to 80 per cent may be purchased. The required kva. rating of capacitors, expressed as a percentage of the kw. load, to correct from a 65 to an 80 per cent power factor can be easily determined from the chart of Fig. 4. For the 100-kw. load used in the examples, 42 kva. of capacitor rating must be installed.

The capacitor location will affect the over-all cost of its installation. The entire bank may be placed at the power station, they may be grouped at several strategic points in the field, or they may be distributed with proper portion at each motor.

Grouped installations present possibilities for overcorrection when a considerable number of motors are dropped from the line. Such overcorrection may result in overvoltage on the remaining motors. If such condition of operation is probable, it must be given consideration with provision for disconnecting at least a portion of the capacitors from the line when the connected motor load drops to some low value, such as 50 per cent. Individual capacitors, installed at each motor location, would be so connected that they would be auto-

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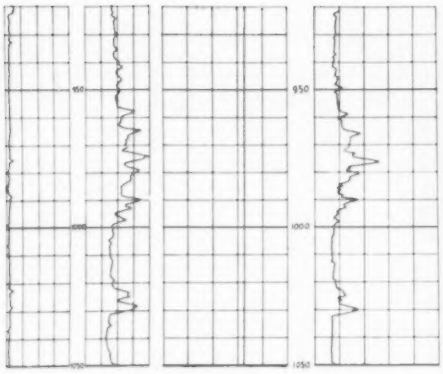


Fig. 1—Comparison of Geo-Logger electric log with a conventional electric log of same hole. Conventional log on right. These logs made in a "strat test" hole.

Fig. 2—Geo-Logger carried along on one of seismograph crew's trucks.

Cheap, Fast Electric Logs

. . . of shallow strat tests and seismic shot holes

by Charles J. Deegan
Associate Editor

EXPLORATION departments are constantly facing the problem of extracting more information at lower cost out of every hole drilled in the ground, no matter how shallow. There is some difference of opinion about how valuable an electric log may be for shot holes in seismic work. But it is conceded that in some places at least it definitely yields worthwhile information. For "strat" tests there is of course no doubt. That is the purpose for which the hole was drilled.

In seismic work, in some few places at least, an electric log of the shot hole aids in picking the proper position for the shot, and may yield information of some service to the interpreter of the seismic record. While the shot holes are often pretty shallow, still they may be deep enough for the electric log to be of some value to the geologist. The value may be directly in connection with oil exploration, or it may be useful for locating water supplies for one of the operating developments, or for some other economic purpose.

Some of the larger companies, with sizable geophysical shops, have built special electric-logging units for shallow-hole work. Other companies, with an extensive program in some area, have leased regular logging units on a monthly basis. Nothing spectacular has been claimed for any of these trials; on the other hand nobody seems to have condemned them after trial. It appears to boil down largely to an economic problem of border lines between costs and value of information obtained.

One of the geophysical instrument companies* is endeavoring to widen the market for this type of information by a specially designed instrument called the "Geo-Logger." It is designed to get at a low cost, an electric log showing resistivity and self-potential curves in holes up to 1,500 ft. deep. Cost reduction is attacked from three main directions: transportation, operating personnel, and time during which hole is tied up.

Transportation is reduced by designing a very small instrument which does not require a special or additional truck or other transportation unit. Operating cost is reduced by making operation and production of a log so simple that a member of the regular drilling crew can set the instrument up and make the log. Time is vital to a shooting crew, and there would be no economy in holding up a whole seismic crew to take a log. So, the new instrument is designed to get a log of an average shot hole within less than 5 minutes' elapsed time; on a 700-ft. strat test, elapsed time about 20 minutes. Elapsed time means from starting to set up to getting out of the hole and out of the crew's way.

As shown in the accompanying illustrations, the unit is compact and small enough to fit inside the trunk compartment of an average passenger car. Or, it can be mounted in an out-of-the-way place on the shooting truck; or in one of the pickup trucks of a geophysical party or strat-test crew.

*Geotronic Laboratories, Inc., Dallas.

(Continued on page 82)

Fig. 3—(Left) Geo-Logger can also be carried in trunk of either a small, or medium-sized sedan. Fig. 4—(Right) The recording system unit is the nerve center of the Geo-Logger. Shown partly withdrawn here, it can be taken out and replaced by a new unit in less than 5 minutes.

Octane Numbers of Gasolines Climb Sharply in 1949

SHARP increases in octane numbers of motor gasolines sold in the United States during the summer of 1949 are indicated by the Bureau of Mines-A.P.I. national motor-gasoline-survey results. The average octane ratings of motor fuels for the country as a whole were one to two numbers higher than for fuels sold during the preceding two summers.

By the research method, the average octane number of premium-price gasolines was 88.0, compared with 86.1 and 85.9 for the summers of 1948 and 1947, respectively. Regular-price fuels had an average research octane rating of 81.9, compared with 80.1 and 80.2 for the previous summers, respectively.

Average motor-method octane number of premium-price gasolines was 80.4, compared with 79.5 and 79.2 for the preceding two summers, respectively. Regular-price motor fuels had an average octane value of 76.4, compared with 75.2 and 75.1 for the summers of 1948 and 1947.

Volatility characteristics of the gasolines tested were not greatly different from those of the summer before. Average Reid vapor pressures of the premium and regular-price fuels were 8.0 and 8.1 lb., respectively, compared with 8.0 lb. for both grades the preceding summer. The distillation tests show small changes at the 10 and 50 per cent evaporated points and a slight trend upward at the 90 per cent point.

Some comparative figures from survey reports for the summers of 1945 to 1949, inclusive, are given in the accompanying table and charts. The latter illustrate the trends in the properties of summer gasolines during that period.

Other tests reported in the survey and their average results are: Gravity, 60.3° A.P.I. for premium-price and 60.1° A.P.I. for regular-price gasolines. Corrosion, negative for all but two of the samples tested. Sulfur content, 0.076 per cent for the premium and 0.097 for the regular-price fuels. Gum-test results, 2.6 mg. per 100 ml. for premium and 2.3 mg. per 100 ml. for regular-price gasolines. Tetraethyl lead contents, 2.15 ml. per gal. and 1.70 ml. per gal. for the two grades, respectively.

For this survey, during the summer months 24 oil and motor companies collected 2,911 samples of motor fuel which were tested in their laboratories and the data made available for this survey. The samples represent the products of approximately 115 companies marketing gasoline and were collected at filling stations in 200 cities and towns throughout the country.

The following tabulation shows by districts the average research method octane numbers of regular-price and premium-price gasolines sold in the summer of 1949:

District—	Motor gasoline, type: Regular	Premium
1. **Northeast area:** Maine, Massachusetts, New Hampshire, Vermont and northern New York	84.9	90.3
2. **Mid-Atlantic Coast States:** Rhode Island, Connecticut, New Jersey, Delaware, Maryland, Virginia, Central and southern New York, and eastern Pennsylvania	84.7	89.8
3. **Southeast area:** North Carolina, South Carolina, Georgia, Florida, Alabama, and eastern and Central Tennessee	84.2	89.5
4. **Appalachian area:** Ohio, West Virginia, western New York, western Pennsylvania, eastern Kentucky, and a small portion of Maryland	83.4	88.2
5. **Michigan**	83.2	87.6
6. **North Illinois area:** Northern Indiana, northern Illinois, eastern Iowa, and Wisconsin	80.8	86.5
7. **Central Mississippi area:** Western Kentucky, southern Indiana, southern Illinois, and eastern Missouri	81.5	87.2
8. **Lower Mississippi area:** Mississippi, Louisiana, eastern and southern Arkansas, and western Tennessee	83.5	89.1
9. **North Plains area:** Minnesota, North Dakota, and South Dakota	80.2	86.2
10. **Central Plains area:** Nebraska, Central and western Iowa, northwestern Missouri, Oklahoma, and northern Kansas	80.2	86.8
11. **South Plains area:** Southern Kansas, southwestern Missouri, western Arkansas, Oklahoma, and northern Texas	79.9	86.0
12. **Southern Texas**	82.6	86.8
13. **South Mountain States:** Southwestern Kansas, panhandles of Oklahoma and Texas, western Texas, New Mexico, Colorado, Utah, Arizona, Nevada, and eastern California	78.3	85.6
14. **North Mountain States:** Wyoming, Montana, Idaho, eastern Washington, and eastern Oregon	79.1	86.4
15. **Pacific Northwest:** Western Washington and western Oregon	82.1	91.3
16. **Northern California**	82.3	90.4
17. **Southern California**	81.9	89.1
National average	81.9	88.0

The bureau's report presents charts, for both winter and summer seasons, showing the trends of octane numbers, Reid vapor pressures, and three important distillation points for the series of gasoline surveys. A map shows the 17 marketing districts of the country and 145 selected locations with the respective numbers of samples indicated. A free copy of R.I. 4644 may be obtained by writing to the Bureau of Mines, Publications Distribution Section, 4800 Forbes Street, Pittsburgh.

TREND IN REGULAR AND PREMIUM MOTOR GASOLINES

Summer	Research octane No.	Motor octane No.	R.v.p. (lb.)	10% evap. (°F.)	50% evap. (°F.)	90% evap. (°F.)
Regular-price gasoline:						
1945	73.3	69.7	7.7	145	251	351
1946	79.3	74.4	7.8	139	233	336
1947	80.2	75.1	8.0	139	235	339
1948	80.1	75.2	8.0	138	238	343
1949	81.9	76.4	8.1	137	237	345
Premium-price gasoline:						
1945	79.7	74.9	7.6	142	243	346
1946	84.7	78.3	7.8	139	226	329
1947	85.9	79.2	7.8	137	226	331
1948	86.1	79.5	8.0	136	228	335
1949	88.0	80.4	8.0	135	227	338

Cotton Valley Suit Subject of Paper

The October 1949 issue of Tulane Law Review contains an article reviewing the Cotton Valley antitrust suit, written by Burns H. Errebo, of Sunray Oil Corp., Tulsa. The problem discussed involves the application of the Sherman Antitrust Act to the unit operation of Cotton Valley field in Webster Parish, Louisiana. The author points out the need for unitization, describes the plan of unit operation, and reviews the application of the Sherman Act, under which latter subject he covers such phases of the Government's complaint, application of the rule of reason, the interstate commerce aspect, and other matters.

The Cotton Valley suit was dismissed last July, but the order of dismissal is now on appeal to the United States Supreme Court.

CASING-LEAK PROBLEMS

by H. N. Lyle

WITHIN the space of a few hours, a hole in the casing of a well can cause the well to become junked, it can dissipate thousands of dollars worth of available reserves, or it can cause disastrous blowouts to the same or adjoining wells. The trouble engendered by a hole in the casing is almost never trivial.

Damaged or faulty pipe is the most common cause of casing leaks, particularly when used pipe is run after no more than a casual visual inspection. In such cases, failure to achieve a circulation shutoff after the cement has been pumped long enough for the plug to reach bottom, or early return of cement to the surface may be indicative of a hole in the casing. When pumping a plug down behind cement, especially with power-driven slush pumps, weak pipe may be ruptured by the excessive pressure of the water-hammer effect of the plug suddenly seating and stopping circulation. The only precaution that can be taken to guard against a joint of faulty pipe getting into the casing string is rigid inspection. Hydraulic testing of each joint before it is run is worth while if there is any doubt as to the condition of the pipe. Several strings of pipe can be tested more cheaply than one string can be repaired after it is in the ground.

When leaks are detected during or immediately after the primary cement job, repairs usually can be made by recementing. If the hole is near the surface, it may be faster and more satisfactory to back off or cut the casing below the leak, remove the faulty joint, then tie back in to the pipe remaining in the well by use of a die collar or one of the several patented patch collars available. When recementing, it is well to consider the possibility of there being more than one hole, and to so plan the repair work to minimize the danger of cementing the tubing or drill pipe due to lack of exact knowledge as to the route the cement and displacing fluid are taking in the well.

The author is consulting engineer, Corpus Christi, Tex. He was born and reared at Shamrock, Tex., attended Texas A. & M. College, and graduated in 1934. Lyle worked on drilling rigs for 3 years, and in 1937 went to South Texas as field engineer for Seaboard Oil Co. Following his war service he was with Seaboard for 2 more years as assistant district superintendent, before starting his consulting business.

On production strings of casing, leak repairs are sometimes made by setting a liner or "short string," or by straddling the leak with packers connected by a pipe sleeve. The obvious disadvantage of this type of repair is the restriction of freedom of operation in future work. It is seldom practicable to make repairs of this type on casing smaller than 7 in. o.d.

Hazards of Casing

Even though casing is good when it is run into the well and cemented, a lot of things can happen to it before its usefulness is ended at the time the well is depleted. As long as a rig is over the hole, the casing is subjected to wear by the drilling string. Rubber pipe protectors minimize this type of wear, but they cannot always be fully effective in preventing it. The wear is usually most severe in the top joint or two, and may be aggravated by the crown block or rotary table not being centered over the hole. A crooked kelly joint can cause excessive wear in the top joint of casing in a very short while. However, wear by the drilling string is not confined to the top joint of casing, but may occur at any point.

When casing is subjected to long wear by the drilling string, it should be pressure tested periodically. This is especially important when high formation pressures are present or expected and heavy mud is being used. When the blowout preventers are removed preparatory to placing the christmas tree on the well, the top of the casing is, on most wellhead assemblies, exposed and it should be inspected carefully for evidence of excessive wear.

A common type of casing hole is that caused by erosion due to fluid jetting from a tubing or drill-pipe hole. This type of hole is most often made when killing a well prior to removing the christmas tree, when, by necessity, fluid pressures are high, the tubing cannot be raised or rotated, and the exact route of the fluid in the well is unknown. Fluid erosion can be much more severe than is generally realized, especially if there is a little sand in the fluid. Jet collars in a tubing string are a source of particular hazard in causing casing holes of this type.

Leaks May Still Develop

Even after casing has been cemented, tested, and the well put on production, leaks may still develop. Such leaks are even more dangerous than those encountered while a rig is on the well. Detection of such leaks may be sudden and drastic, or the leaks may go unnoticed for several months. Any sudden change in the producing characteristics of a well should lead to prompt suspicion of a leak, especially when such changes are accompanied by increases of water production with sand, shale, or cement fragments. Chemical comparison of water samples may offer a quick means of confirming a leak, and thus aid in planning the repair work.

A well may have a casing leak and show no evidence of it at the surface. Such leaks may not be discovered for some time, and usually are detected by noting an abnormal loss of bottom-hole pressure, bradenhead pressure changes on that well or adjacent wells, changes in productivity, or abnormal pressures encountered in nearby drilling wells. When any of the above conditions are noted, and no other evidence of a leak can be found, temperature surveys will sometimes result in finding the leak.

Old perforations, inadequately cemented, frequently will start to leak as the internal pressure against them changes. Unless there are strong reasons to the contrary, a well which

has perforations above the producing zone should be completed with the tubing on a packer, leaving the casing annulus full of fluid. This type of completion is particularly applicable to wells that have sufficient pressure to flow. At a later date the packer may be removed to facilitate artificial lift, if necessary, but at least the well will be protected while the leak hazard is greatest.

Chemical reaction between the well fluid and the steel casing often causes a hole in the casing. Failures of this type are most prevalent at the fluid level in the casing. This trouble may be prevented, when the fluid is known to be corrosive, by setting the tubing on a packer and filling the annulus with a noncorrosive fluid, or by the introduction of suitable inhibitors into the well.

Electrolytic Action

Electrolytic action is another cause of casing holes. The casing itself, traversing repeated strata of dissimilar material, acts as a conductor for current generated by galvanic action. When such current leaves the casing to return to the earth, it erodes the casing from the outside by removing iron from it in the same manner that an electroplating machine removes metal from one electrode and deposits it on another. This type of current is known to exist, because it has been measured by lowering electrodes into a well that was insulated at the surface from stray currents, but to date no practical method of combating it has been evolved.

Stray surface currents entering the casing from flow lines or gas lines are a more potent source of current, but this hazard may be eliminated by insulation or cathodic protection. Since 1 amp. of current, operating for a year at full efficiency, is capable of removing about 23 lb. of iron from a string of casing, it is apparent that this action, if present, is dangerous even if the efficiency is low. It seems that the degree of localization at the point of departure of the current from the casing may be of more importance than the amount of current flowing. For instance, in one field in South Texas, wells carrying as much as 2 amp. have been unharmed, while others with less than 0.1 amp. have developed holes. It should be noted that the stray currents in a surface system are erratic and not at all uniform or of constant duration.

A common aftermath of a casing hole is a fishing job to recover tubing stuck in sand inside the casing. Such jobs are among the most tedious, difficult, and expensive of all fishing jobs. The reward of getting a well back on production and saving a large investment usually justifies diligent and continued effort to clean the hole. Since it is never possible to know how much sand is causing the tubing to stick, efforts to free it should start conservatively and become progressively more drastic. Unlike open-hole fishing jobs, time is not a complicating factor while working inside pipe.

When tubing is stuck, the first, best, and easiest thing to do is to pull on it. A good weight indicator is absolutely necessary if effective pulling is to be done. An understanding of the behavior and limitations of pipe in tension, together with close observation to be sure the limitations are not exceeded, is necessary also. Many jobs of this kind are needlessly complicated at the outset by pulling the tubing in two, leaving a bottle-necked and cold-worked fish to be recovered.

If no upward movement can be obtained by reasonable pulling, it may be possible to work the pipe downward a little. If any movement in either direction can be obtained, it is usually just a matter of patience and time until the pipe can be freed completely. If no movement can be obtained after repeated pulling and slackening off, circulation should be tried. Ordinarily, application of pump pressure will result only in packing the sand more tightly around the tubing, but if the tubing is open on the inside, so that pump pressure can be transmitted upward against the bottom of the bridge, it sometimes is possible to start the pipe to moving. Alternate application and release of pressure will sometimes loosen a bridge that otherwise will not yield.

More Expensive Methods

If the tubing cannot be freed by the methods described above, and the operator should not give up on them too easily, it is necessary to resort to more expensive methods. In general, two courses of action are open: working from the inside or from the outside of the tubing. If the inside method is chosen, the tubing should be cleaned to bottom with a sand pump or by washing with small pipe. If the pipe cannot be worked loose after the tubing is clean on the inside, a hole can be punched in the tubing below the stick point and an attempt to circulate made. If the tubing is still stuck, an inside cut can be made well above the stick point and outside operations started. One caution to observe is never to make an inside cut below the stick point, because if the pipe cannot then be pulled, subsequent cuts may result in dropping one piece of the fish down alongside another.

The stick point may be determined electrically or it may be calculated from observed stress-strain data. If the latter method is used, consideration should be given to the possibility of two or more bridges, the upper one of which, while not competent to stick the pipe tightly, will nevertheless exert a drag which will result in erroneous conclusions as to the actual stick point.

Outside operations usually start with backing off as deeply as possible, then washing over and making outside cuts on the remainder. To back off, all the weight of the pipe is slacked off and the pipe tightened by turning to the right as the weight is gradually picked up by the draw works to the full weight of the string. This process is repeated until the pipe is tight throughout the full range of its weight and there are no easy-to-turn places remaining in it. Then the pipe is picked up to its full weight, placing the entire string in tension that decreases with depth, and turned to the left. The backoff will in most cases occur within a joint or two of the top of the bridge.

Short String of Wash Pipe

With the hole cleaned to the top of the fish, a short string of wash pipe, usually not more than 400 to 500 ft., is run and washing over started. If the tubing is straight and fairly well centered in the casing, with no odd-sized projections on it, the washing over may be easy and rapid. Cuts should never be made closer than 20 to 30 ft. to the washdown bottom to minimize trouble in getting over the fish again with the wash pipe after the cut. The washing and cutting are continued until either the entire fish is washed over or until a point is reached beyond which washing is not possible. Tubing, packed with sand inside casing, can be almost unbelievably unyielding.

In one recent job a tubing section of this nature was encountered over which it was not possible to wash or mill. The top of the fish was at 5,580 ft., the worn section was at 5,601-07 ft., and the sand had been removed to 5,619 ft. by going alongside the 2-in. fish with 1-in. wash pipe inside the 5½-in. casing. Two rotary shoes and a section of blank pipe had been worn out attempting to get past this section of pipe, but it could not be moved enough laterally to allow the wash pipe to pass. A shoulder was forming on the fish, and more milling would have resulted in cutting the fish without ever moving it laterally.

Rotary shoe design is important in this type of work. In general, small, closely spaced teeth are better than large, coarse ones. Sometimes a section of plain-end pipe, smooth on the bottom, is better than a toothed shoe, particularly if it is to be run on metal. If the shoe has been hard faced or dressed with hard metal inserts, the operator should be sure that it has been stress relieved and reheat treated. If it has not been so treated, the severe metal-against-metal service will almost certainly

(Continued on page 82)

ACID SLUDGE FUELS

used in steam generation . . .

by H. Kaye* and R. K. Spencer*

1. Acid Sludges—General Discussion

THE treatment of petroleum products with sulfuric acid to improve their color, odor, and stability is one of the fundamental processes in refining, and the adoption of newer methods has not seriously affected the total consumption of sulfuric acid by the oil industry. Only a part—and a very small part at that—of the sulfuric anhydride consumed in the treating operation finds its way to the market as part of the petroleum product being made, the vast majority of it reacting with a portion of the oil being treated to form acid sludge.

Spent acids from the treatment of such different products as cracked gasoline, petrolatum, and heavy lubricating oils are known as acid sludge. The lack of information that exists about their exact chemical composition is indicated by the various names given to them, as for example kerosine sludge, white-oil sludge, or lube-oil sludge. The general composition is well known, however, and for the purpose of regeneration, destruction, or disposal, sludge can be considered as made up of these five components: (1) sulfur trioxide, (2) sulfur dioxide, (3) sulfonic acids, (4) water, and (5) "neutral oils." Still greater simplification reduces this classification to: (1) mineral acid, (2) organic acid, and (3) neutral oil.

The mineral acid content of sludges can be as low as 35 per cent (calculated as H_2SO_4) when reactive products such as heavy lubricating oils are being treated with small amounts (3 to 5 per cent weight or say 10 to 15 lb. per barrel) of low-strength, 66° Be and weaker, acid. On the other hand it may rise to over 80 per cent in the later stages of treating such highly refined products as liquid paraffin, when the acid is used in larger quantities, up to 30 lb. per barrel and greater strength, as 20 per cent oleum. The viscosity of the sludge will, in general, be greater the lower the content of mineral acid, the "thinnest" sludges, and those of highest acid content being those from gasoline treatment, alkylation processes, and the last stages of liquid paraffin and white-oil treatment.

The sulfonic acid content varies considerably, it being greatest in those sludges resulting from processes using high-strength acids as, for example, the production of liquid paraffins and white oils. These sulfonic acids are preferentially water soluble and are known as "green" acids to distinguish them from the oil-soluble "mahogany" sulfonic acids. In quantity they vary from 10 to 30 weight per cent of the sludge.

The water content results from the liberation of H_2O in the sulfonation reaction and is frequently the primary reason for the discard of the acid sludge while it still contains large amounts of sulfuric acid, the strength having fallen due to the liberation of water, below the lower reactive limit. Water (in excess of that combined in the H_2SO_4) may vary between 15 and 20 per cent by weight.

The so-called "neutral oil" is composed of those hydrocarbons and hydrocarbon derivatives which are not describable as sulfonic acids. It includes unreacted hydrocarbons in solution, heavy tar-like polymers, and highly condensed hydrocarbons, sulfones and sulfates. Its chemical composition is diverse and largely unknown and varies enormously, dependent on whether the parent material is a light material such as gasoline, or a heavy fraction of petroleum such as a lubricating oil, or even a long residuum.

2. Methods of Disposal

Disposal of the large quantities of sludge produced by the average lube-oil-producing refinery can be effected by a variety of methods, dependent on the size of the problem and the resources of the refinery. The simplest of these methods is to dump the sludge in open pits and allow it to weather from a highly acid highly viscous liquid to a solid pitch which can then be utilized with other solid fuels for firing boilers. This method is obviously impracticable where the quantities to be disposed of are large and the sludges are high in acid and low in hydrocarbon content. In such cases, e.g., alkylation, thermal decomposition of the sludge to form sulfur dioxide and the subsequent production of sulfuric acid by the contact process, is a possible answer and at least two proved processes using this route exist. However, these plants do not normally offer a solution unless consumption of sulfuric acid is in excess of 15,000 tons per annum or the cost of acid, due to the refinery's geographical position, is abnormally high.

Disposal by neutralization and dilution with water is not often practicable, the operation being expensive in chemicals and unsuited to viscous sludges, and the complete removal of the neutral-oil fraction proving difficult owing to the ease with which stable emulsions are formed through the presence of sulfonates.

Finally, there is destruction by burning as a liquid fuel, either as made, in the acid state, or after hydrolyzing with hot water and the separation of the weak acid by gravity settling. In either case the sludge may be burnt alone or diluted with fuel oil. The latter is the more common, most authorities suggesting that the low calorific value of the sludge and its variable water content necessitates an admixture of more combustible fuel such as oil or gas. Contrary to most expectations, the burning of acid sludge in this way does not normally give any trouble with corrosion of boilers or steel flues or stacks, the gases being in all cases above the dew point until emergence from the stack and there being no evidence of attack by SO_3 so long as this condition is maintained.

3. Fuel for Steam Generation

At the Trafford Park (England) refinery of Manchester Oil Refinery, Ltd., the problem of disposing of about 10,000 tons per annum of mixed acid sludge resulting from the treatment of lubricating oils with 98 per cent acid, and technical white oils and liquid paraffin with oleum, was met by burning the sludge as it was produced under a battery of steam boilers. The quantity was such that dilution with oil was considered undesirable since it would call for increased capital outlay and result in steam production in excess of the refinery needs. The equipment described below was therefore developed after a period of learning by trial and error, and operates today as a routine section of the steam-generation plant. The sludge burnt has an acid content of from 40 to 75 per cent by weight and a calorific value of 4,000 to 6,000 B.t.u. per pound. It is normally a free-flowing liquid, but occasionally may be of high viscosity.

Sludges from the various treatments fall into a common receiver whence steam-driven reciprocating pumps move the mixture to storage tanks in preparation for burning. Storage capacity for about 1 day's burning is provided by two steel tanks. These tanks may be used alternately as settling and feed tanks, and while the contents of the settling tank are allowed to stand so that any oil sent

*Manchester Oil Refinery, Ltd

over can be drawn off, the feed tank is circulated continuously to maintain an even composition. No heating is provided in tanks or lines, as steam heat carbonizes the sludge and results in blockages.

Circulation of the feed tank is carried out from the bottom of the tank in a ring main running past the burners to the top of the tank; the head of sludge on the burners is, by this method, kept constant at 30 ft. The pipe lines handling sludge are generously proportioned, as sometimes the sludges available are heavy and a flow is maintained with difficulty.

4. Equipment for Burning

The burning arrangement consists of a rectangular fire-brick structure in the form of a dutch oven with a bonded arched roof. Experience has enabled the furnace to be proportioned to give the necessary heat to burn the maximum amount of sludge without undue stress on the brickwork. The proportions of the furnace are 0.4 length = breadth = height with 1.4 cu. ft. of furnace volume provided per pound of sludge burned per hour. This large furnace volume allowance is necessary for two reasons: (1) ample space for excess air under natural draught conditions, and (2) the low heat-liberation rate (about 4,000 B.t.u.'s per cubic foot furnace volume) requires a hot combustion chamber without undue overheating of brickwork at the maximum rate of firing. The walls and arch are made purposely as thin as safety will permit to help in cooling the brickwork.

On top of the furnace at its end remote from the burner, a vertical-type fire-tube boiler is mounted on steel framework. This is a compact arrangement whereby firing and water tending are carried out by the operators at one level. The boiler may be regarded as an ordinary type used for utilizing waste heat but some advantage is gained from radiant heat.

One burner is used per furnace. Its fittings are made up from ordinary pipe material and the burner consists of an outer tube for the passage of sludge with a central tube for steam. The small-bore central tube is set back from the open end of the outer tube and the steam from it injects the sludge into the furnace in the form of a round slightly divergent spray. This type of spray has been adopted in an attempt to keep as much sludge as possible from striking the side walls and floor before burning is completed. It has been found impossible to avoid this altogether and burning on these areas causes some wasting of the brickwork.

The steam used for atomization of sludge is about 0.35 lb. per pound. This represents about 15 per cent of the steam generated by the boiler and, although relatively high, is compensated for by the fact that the steam injected into the furnace plays its part in aiding complete and smokeless combustion.

A burner using fuel oil is fitted to the furnace and is used when starting up. It is sometimes necessary to use fuel oil when the sludge is very heavy and cannot be injected into the furnace in sufficient quantity to maintain temperature. Normally, with well-mixed sludges, the fuel oil is not needed.

The furnace temperature for best burning conditions is about 2,100° F. This temperature is easily reached when burning the maximum quantity of well-mixed sludge. About 80 per cent excess air is required to keep the brickwork from overheating at this burning rate. With natural draft, excess air beyond 80 per cent results in burnt brickwork. Overheating will occur at reduced loads if the percentage of oil entrained in the sludge rises.

Exit-gas temperature from the boilers is about 600° F. at maximum burning rate. This shows good boiler performance, although the actual overall thermal efficiency is not high because of large radiation and stack losses. About 2.5 lb. of feed water at 110° F. is evaporated to steam at 100 psi. per pound of sludge. Taking the average heating value of sludge as 5,000 B.t.u. per pound, the thermal efficiency is 55 per cent.

As might be expected, cost of maintaining the dutch oven is higher than that for a normal oil-fired setting of similar size, and averages around 30 pence* ($0.35) per ton of sludge burnt. The cost of maintaining the whole unit, including boiler, oven, flues, tanks, pumps, pipe lines, burners, etc., is around 85 pence ($0.99) per ton. The total cost of running the plant, inclusive of depreciation, amortization, or other fixed charges, is approximately 350 pence ($4.08) per ton of sludge consumed. As the steam so generated is valued at 370 pence ($4.32) the operation of the plant can be considered a profitable undertaking, particularly if the only alternatives possible are disposal by burying or neutralization, both of which require substantial expenditure without yielding any return.

*Computed at $2.80 per £

Laboratory Determination Of Relative Permeability

(Continued from page 69)

displacement method might be used for reservoir-accumulation problems or problems involving gravitational readjustments within the reservoir. The dynamic method would appear to be the one which should be used involving natural water drive, water flood, or gas injection, while studies by the solution-gas method should be used for natural depletion problems, particularly in the range above critical gas saturation. It would seem to be particularly questionable to use the ordinary capillary-pressure curves for solution-gas-drive calculations, especially if the core specimens are of low permeability.

Other displacement mechanisms, or combinations of the above mechanisms, may exist which will result in still different spatial arrangements of liquids in the pore space. Reversing the order of operations with associated hysteresis effects must also be considered in laboratory studies of relative permeability. On the basis of present knowledge the most reliable laboratory approach is to simulate the field performance, always working in one direction from virgin reservoir conditions to depletion, thereby avoiding complicating hysteresis effects.

In the average reservoir all three of the mechanisms for displacing oil will be in operation for at least a portion of the life of the field, and in many cases several may be in operation concurrently. In principle the determination of the relative-permeability relations for the entire life of the field from laboratory data would require a knowledge of the effect of (1) the method of desaturation, (2) the previous history, and (3) the simultaneous action of several desaturating mechanisms on relative permeability.

In practice, however, the data from various methods will probably overlap considerably so that the results of one method, such as the capillary-pressure or the dynamic-displacement procedure, may apply over a wide range of saturation values. It is understood, of course, that certain portions of the system such as that represented by solution-gas displacement in the early part of the productive life of the field may require special studies to determine the relative-permeability relations applicable to the special case in question.

The base for relative permeability ratio.—Relative permeability has been defined as the ratio of the permeability to a fluid at a given saturation divided by the permeability to the same fluid at 100 per cent saturation of that fluid.[5] However, in nearly every case of a naturally occurring porous medium, the specific permeabilities to the various phases, such as gas, oil, and water, will not be identical due to Klinkenberg and hydration effects.

If dried cores are used for determination of the permeability to air or oil at 100 per cent saturation, these values are not comparable to data obtained on the same core for air and oil where brine is present. Any single liquid should give the same permeability for a porous medium as long as the properties of the porous medium have not been altered. However, in the instance just cited capil-

lary structure is altered by the swelling of the hydratable materials in the presence of brine.

Consequently, it is proposed that the relative permeability of oil or gas be defined as the ratio of the effective permeability of oil or gas at a given saturation divided by the permeability to reservoir brine at 100 per cent saturation. Thus, the relative permeability to oil becomes the permeability to oil at a given saturation divided by the permeability to brine, and the relative permeability to gas becomes the permeability to gas at a given saturation divided by the permeability to brine. In the case of relative permeability to gas, a correction should further be made for the Klinkenberg effect.

References

1. U. S. Patent No. 2,345,935, April 4, 1944, G. L. Hassler.
2. Morse, Terwilliger, and Yuster, Producers Monthly, 11, No. 10, p. 19 (1947).
3. Leverett and Lewis, Trans. A.I.M.E., 142, 107 (1941).
4. Wycoff and Botset, Physics, 7, 325 (1936).
5. Brownscombe and Slobod, Petroleum Technology, Sept. 1948, Disc. of T.P. 2433, p. 10. In this earlier discussion the term "static displacement" was used for what is here called "capillary pressure displacement."
6. H. J. Welge, Petroleum Technology, 11, T.P. 2433 (1948).
7. Martinelli, Putnam, and Lockhart, Trans. A.I.Ch.E., 42, 681 (1946).
8. A.P.I. Code 27

Power Factor Correction On a Pumping Lease

(Continued from page 75)

matically disconnected from the line along with the motor.

Normally the first cost of either 65 or 80 per cent power-factor machines without power-factor correction will be about equal, and less than the 80 per cent machine with capacitors. Usually generators of proper rating are installed without the capacitors, leaving the use of capacitors and attendant advantages to the future.

Advantages of Power-Factor Correction

Most power companies allow a premium on minimizing the average peak kva. demand over some prescribed period such as 15 minutes. An improvement in power factor, therefore, frequently will result in a large annual saving in the power bill.

When power is generated on the lease, minimizing of peak kva. demands on the generator is important. When a considerable number of wells get into step for a short time, the peak kva. load on the generating station may be excessive. It must not exceed that maximum value at which the generator can maintain the minimum voltage required to prevent the motor line starters from dropping out. Power-factor correction will assist in reducing this peak.

The advantages of power-factor corrections may be summarized as follows:

1. Reduces required kva. capacity of generators, or of main transformer bank, or increases kw. capacity of existing units.

2. Reduces peak kva. demand on lease power plants.

3. Reduces the average peak kva. demand for utility power.

4. Reduces voltage drop and line losses in the distribution system, or permits increased motor load at same voltage drop or line losses.

Cheap, Fast Electric Logs

(Continued from page 76)

The main part of the instrument is mounted inside a single aluminum case about 18 in. high, 26 in. long, and 14 in. wide. For shot-hole work, a small tripod must be carried to support the cable over the shot hole. On strat tests, the cable is run through one of the sheaves in the rig.

The primary power source is an extra belt-driven generator, usually mounted under the hood of the car or truck, just above the regular generator. This is connected by a cable to an electric motor which is inside the aluminum case. It supplies about 1,000 watts at 110 volts on 60-cycle alternating current.

The recording system, which is the nerve center of the instrument, is extremely small and compact. It is designed to withstand rugged field use, but if necessary can be taken out and replaced with a new unit in less than 5 minutes (see illustration). The rest of the equipment inside the case is primarily mechanical and conventional.

Obviously the amount of widening of market will depend on how successfully costs are reduced: (1) by eliminating an extra vehicle; (2) by eliminating a special operator, and (3) by reducing the time the drilling crew is held up while the log is being run.

In shallow strat-test drilling, lower cost logging could stretch the budget and allow more holes to be drilled for the same money. In seismic shot-hole work, the availability of more such logs, and added experience in using them, might increase their usefulness to the geophysical crews. The geologist can always find use for more data, if the cost is not too high.

Casing-Leak Problems

(Continued from page 79)

cause fragments to break off the shoe and further complicate the fishing job.

When no more progress can be made by washing over, it is sometimes possible to wash alongside the tubing with small pipe. This is a delicate operation and should be done most carefully. Advances should be made by light spudding and slight turning, with the main dependence for progress being in the jetting action of the fluid. Rotation should never be attempted.

Jarring, especially if the fishing string is of drill pipe, often is effective in freeing a fish. The jars should be run as near the bottom of the fishing string as is feasible, so that the blows will be sharp and hard against the fish.

One method of freeing stuck tubing that is sometimes overlooked is the utilization of the well's formation pressure. If practicable, the casing may be jetted dry to the top of the fish and the formation encouraged to produce and remove the bridge. Or, a testing tool may be set near the top of the fish, and the bridge forced from below into the empty fishing string. This is the method that finally was effective in freeing the piece of tubing topped at 5,580 ft., mentioned above.

References

1. Clay, J. A., Jr., Plastic Insulation. The Oil and Gas Journal, July 26, 1947.
2. Hayward, J. T., Cause and Cure of Frozen Drill Pipe and Casing. The Oil and Gas Journal, June 3, 1937.

BOOKS

STANDARD METHODS FOR TESTING PETROLEUM AND ITS PRODUCTS. Tenth Edition. Published by Institute of Petroleum, 26 Portland Place, London, W.1. 660 pp. 31s. 6d.

This volume describes in detail the apparatus for and the procedure of 116 methods for determining physical and chemical properties of crude petroleum and its products. The properties for which tests are available are extremely wide in range, varying from specific gravity to settling point, from salt content of crude oil to residue on sieving bituminous emulsion.

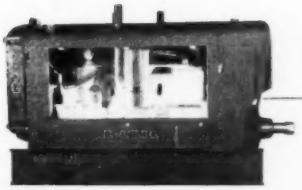
Compared with the previous (1948) edition, there are numerous changes, and these are listed in the preliminary text of the book. The three new methods are of considerable importance. They are: (1) An engine method of testing heavy-duty lubricants in relation to ring-sticking, wear, and deposit accumulation; (2) a method for Research octane number of motor fuels; (3) a method of assessing the corrosive tendencies of cutting oils in contact with cast iron.

Various methods have been revised in detail, including calorific value (now known as heat of combustion), distillation, viscosity, etc., while many editorial amendments have been made to avoid ambiguity.

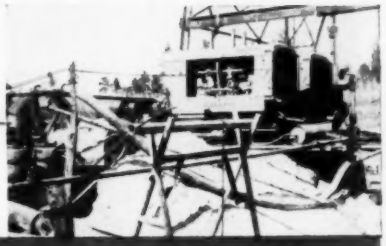
ELECTRIC ARC WELDING—PROCEDURE AND PRACTICE. Published by Hobart Trade School, Troy, Ohio. 544 pp. $2

This book's purpose is not only to help those interested in learning more about arc welding, but to give a better understanding of the rudiments and changes in welding procedure that have taken place during its rapid growth. It is replete with photographs illustrating every conceivable use of arc welding, and with sketches explaining various operations.

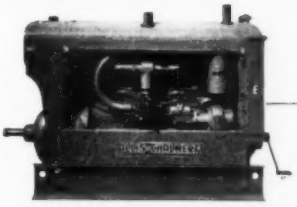
ALLIS-CHALMERS ENGINES



A-C Model L844
6 cyls. 5¼" x 6½"
844 cu. in. disp.
110 bhp at 1050 rpm
Torque 590 ft. lbs. at 700 rpm

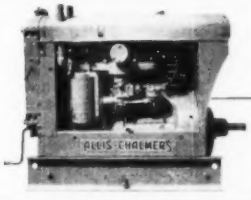


LOW INITIAL COST



A-C Model E563
4 cyls. 5¼" x 6½"
563 cu. in. disp.
74 bhp at 1050 rpm
Torque 400 ft. lbs. at 700 rpm

MODERN DESIGN FEATURES



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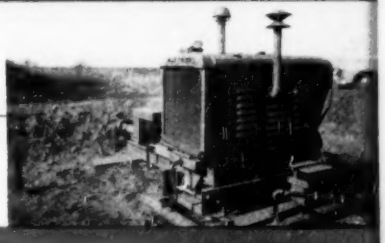
4 cyls. 4½" x 5"
318 cu. in. disp.
51 bhp at 1400 rpm
Torque 200 ft. lbs. at 900 rpm



LOW FUEL and LUBE COSTS

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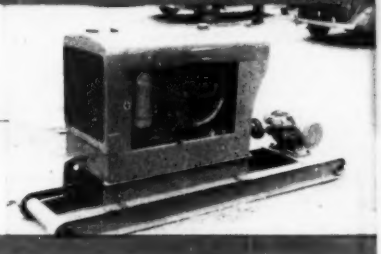
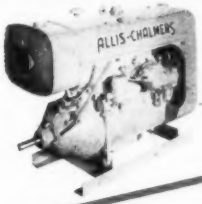
4 cyls. 4" x 4"
201 cu. in. disp.
34 bhp at 1400 rpm
Torque 128 ft. lbs. at 1200 rpm



LOW MAINTENANCE



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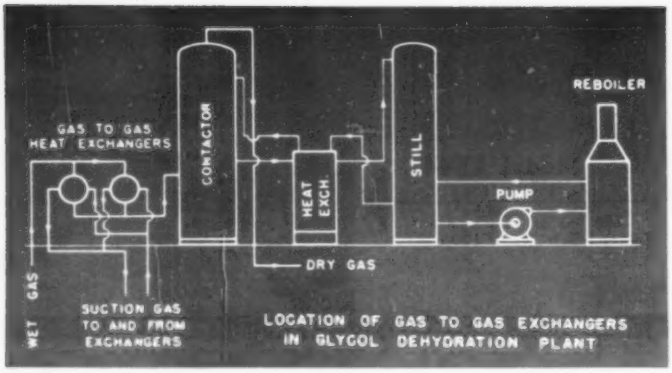


Fig. 1

Aspects of

GAS HEAT EXCHANGERS

As Applied to

Transmission-System Problems

CROSS-COUNTRY transmission of large quantities of natural gas through a pipe-line system is an undertaking which involves vast power requirements, and, since there is no way of obtaining this power with perfect thermal efficiency, the process must include satisfactory means for dissipating and rejecting the waste heat given off from the system. This waste heat appears in many forms, some of which present no problem of disposal, while others require expensive equipment for their dissipation. The scope of this discussion is not intended to include recovery of useful work from these heat sources. Instead it deals with economical means of handling some of those heat loads which do not lend themselves to practical recovery methods.

The primary consideration in the study of a cooling problem is as follows: Ultimately, the heat load involved must be rejected to one of two large natural reservoirs, the earth or the atmosphere. The problem then resolves itself to finding the most practical way of accomplishing this end, bearing in mind the basic factors of economy and dependability. Following this reasoning, it is apparent that the introduction of an intermediate stream of some cooling medium between the heat source and the heat sink, while often necessary and unavoidable, is nevertheless the first step in complicating the problem. When these cooling streams are compounded, as, for instance, in the case of engine-oil cooling, the problem becomes correspondingly more complicated and involves more equipment.

Disposing of Heat

Considering the example just mentioned, the oil receives heat from the engine and transfers this heat to a water stream in the conventional-type oil cooler. This water stream may then carry the heat to a cooling tower where another transfer occurs between water streams, and the waste heat is finally rejected to the atmosphere. Basic transfer of heat from engine to atmosphere has been achieved by three intermediate cooling mediums. Since the great majority of practical cooling problems involve one or more of these "connecting links" between source and point of rejection, it is easy at times to overlook the fundamental process.

Thus, towards the end of simplification and reduction of the equipment required, the design engineer should, in general, attempt to find the most direct practical means of disposing of the heat. Therefore, when the temperature level is high enough, the possibility of direct air cooling must always be considered. Similarly, when a small heat load is encountered at a moderate temperature level, there is the possibility

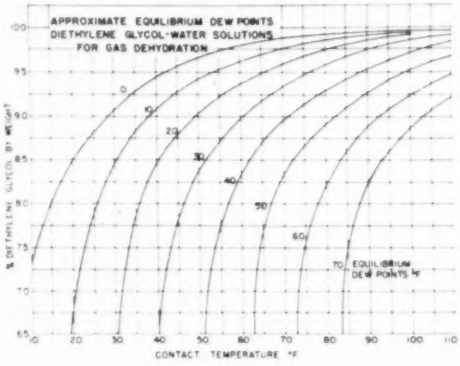

APPROXIMATE EQUILIBRIUM DEW POINTS DIETHYLENE GLYCOL-WATER SOLUTIONS FOR GAS DEHYDRATION
% DIETHYLENE GLYCOL BY WEIGHT
CONTACT TEMPERATURE °F
EQUILIBRIUM DEW POINTS °F

Fig. 2

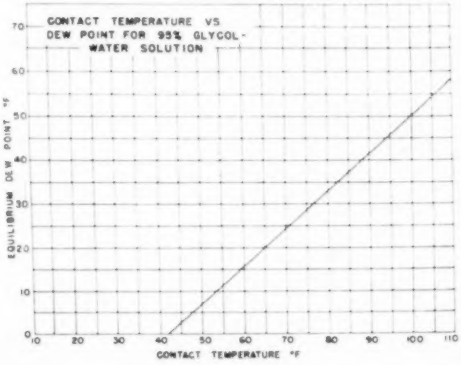


Fig. 3

by F. S. Young*

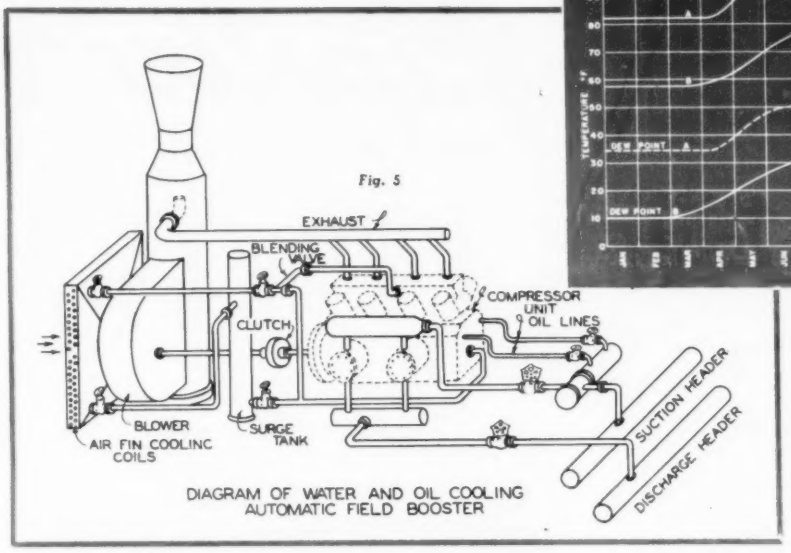


Fig. 5

DIAGRAM OF WATER AND OIL COOLING AUTOMATIC FIELD BOOSTER

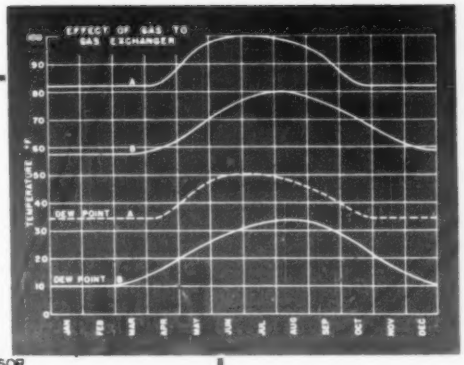


Fig. 4

that this heat can be absorbed economically by a cool suction gas stream.

Unless the distance between stations in a transmission system is unusually short, the pipe line, in itself an immense gas-to-earth heat exchanger, maintains the gas on the suction side of a station at or near ground temperature. So long as the gas temperature is not increased enough to affect materially the horsepower requirements of the station, the relatively low-temperature gas stream can be used as a receiver for some heat loads. This discussion deals primarily with such applications of gas cooling and will attempt to evaluate, by comparison and analysis, the advantages obtained.

When considering the feasibility of gas as a cooling system, certain advantageous applications become apparent, as do certain limitations. At stations where water is scarce—particularly in the case of those stations without gas aftercooling — the suction-gas stream is well suited as an absorbent for some of the smaller station-heat-loads such as oil cooling. In fact, in such locations, suction-gas oil cooling has been successfully incorporated with air-cooled jacket-water systems to the end that open water-cooling equipment with its accompanying water makeup problem has been eliminated. Also, in the case of automatic desulfurization plants located at the well head, the gas stream can be used to cool the still overhead, again eliminating water cooling and pumping power.

Of course, under some arrangements, gas cooling serves merely to transfer a heat load from one service or one stream to another. When the discharge gas is cooled before leaving the station, the heat picked up by the gas in a suction-gas oil cooler is added to the aftercooling load and finally dissipated in the gas aftercooler. This trading and collecting of heat can often be used to advantage in simplifying piping layouts and equipment requirements. Also, in the case of a glycol dehydration plant located on the discharge side of a compressor station, definite advantage is obtained by installing a gas-to-gas heat exchanger upstream of the plant. This effectively lowers the contact temperature and the dew point. In such an installation, it is possible to lower the temperature of the discharge gas well below the temperature ordinarily attained in a cooling tower. As has been pointed out, heat is merely transferred to another stream, but the lower temperature level is being utilized to obtain better dehydration. A more detailed analysis of this arrangement will be given later.

As to general performance of gas exchangers, very satisfactory results have been experienced with such equipment. Maintenance costs have been low and very little fouling has been encountered. Close agreement with design figures in all such in-

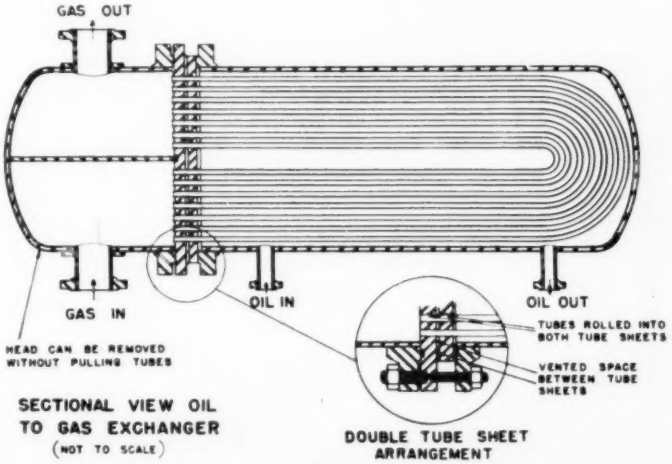
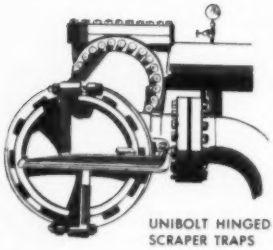


Fig. 6

*Assistant chief engineer, Panhandle Eastern Pipe Line Co. Presented at N.G.A.A. Amarillo Plains regional meeting, Amarillo.



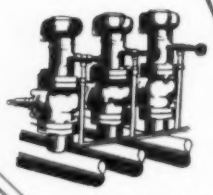
UNIBOLT HINGED
SCRAPER TRAPS

Pipeliners

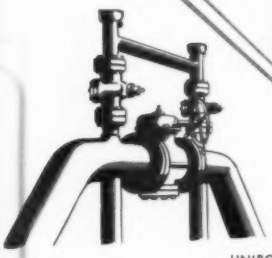
ARE MAKING THE MOST

OF A GOOD THING . . .

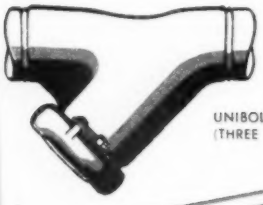
UNIBOLT



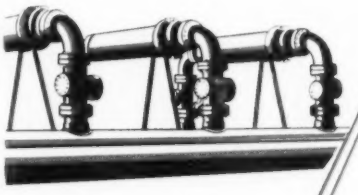
UNIBOLT COUPLINGS
WITH BLANKING PLUGS
ON TERMINAL MANIFOLDS



UNIBOLT COUPLINGS WITH
BLANKING PLUGS ON
GAS LINE BLOWDOWN



UNIBOLT STRAINERS—
(THREE TYPES)



24" UNIBOLTS ON
MAIN LINE GAS SCRUBBERS

18" UNIBOLT WITH
BLANKING PLUG ON
PRODUCT LINE FILTER

On any pipeline connection where flanged unions or closures are now used, a UNIBOLT Coupling can be employed to real advantage.

One, UNIBOLT provides a safer, stronger, joint because the unique UNIBOLT design places more metal in shear.

Two, UNIBOLT provides a more convenient connection or closure because of its time-saving design and blanking plugs which are available with a hinge to facilitate opening and closing.

Three, UNIBOLT provides a light-weight, less bulky unit which is economical, completely salvageable and interchangeable.

Presented here are the most common uses of UNIBOLT Couplings and blanking plugs in pipeline service. Complete details on each product will gladly be sent on request. Inquiries are invited on special pipeline manifold fabrication service.

THORNHILL-CRAVER CO.

HOUSTON UNIBOLT **TEXAS**

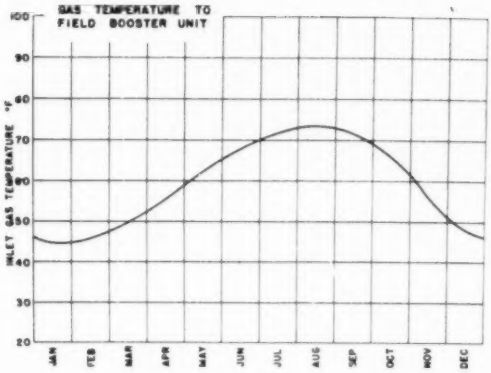


Fig. 7

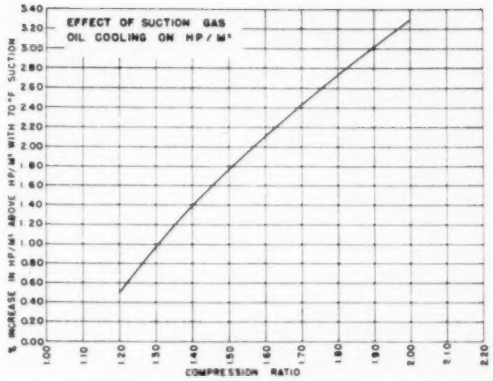


Fig. 8

stallations has been obtained.

The two most common forms of gas heat exchangers in use on the Panhandle Eastern System are the suction-gas oil cooler and the gas-to-gas exchanger for dehydration plants. Both types have been mentioned earlier, but it might be of interest to study them intensively. Each has proved itself in operation and merits some analysis, as to its effect.

First, let us study the gas-to-gas exchanger serving a glycol dehydration plant. This was the earliest application of gas cooling on the Panhandle System. Fig. 1 shows the location of such an exchanger in a plant flow scheme. Gas from the field passes through the shell side of the exchangers and absorbs heat from the discharge gas. The discharge gas passing through the tubes is correspondingly cooled by this transfer and enters the contactors at a lower temperature. Fig. 2 indicates the effect of contact temperature on the equilibrium dew point for various concentrations of glycol solution.

Assuming that the plant operates with a 95 per cent solution to the contact towers, this chart can be replotted as shown in Fig. 3. The dehydration of gas is largely of interest during November through April. Without gas-to-gas exchangers, a plant might receive wet gas at about 85° F. during this period. This would be a fair figure based on the operation of an atmospheric cooling tower aftercooling the gas from the compressors. From the chart, the equilibrium dew point corresponding to 85° F. is 37° F. With gas-to-gas exchangers, the contact temperature might easily be lowered to 70° F., which corresponds to a dew point of 24° F. Also, the exchangers serve to "iron out" the fluctuating diurnal temperature of the gas from a cooling tower, a commonly experienced phenomenon which is particularly troublesome during winter days when proper dehydration is critical. Notice, too, that the colder suction gas, the temperature of which follows the ground temperature, gives the best cooling and the lowest contact temperature precisely when it is needed. The overall process is largely relieved of the effects of daily weather and temperature changes, and gives dew-point performance which is in keeping with the seasonal ground-temperature condition, a very important advantage.

In summer, when hydrate formation is less likely to occur, the gas exchangers may be bypassed to prevent an unnecessary increase in the suction temperature; or, for that matter, it is likely that conditions might be such that the plant operator could shut down the dehydration unit.

At Panhandle Eastern's compressor station near Liberal, Kans., a bank of these gas-to-gas exchangers has been in operation for several years. Fig. 4 shows year-round temperatures recorded at this setting. The upper line is the temperature of the wet gas to the exchangers; the second line shows the temperature of this gas as it leaves the exchangers. Below these lines are two dew-point curves, the lower being the actual dew point obtained and the upper a calculated dew point that would have been obtained without the gas exchangers. This lowering of the dew point required no change in the operation of the glycol plant proper. Since gas-to-gas exchangers of this type require minimum attention, increase in operation and maintenance charges occasioned by the addition of the exchanger bank was practically nil.

Points to Consider

A thorough, economic analysis of the desirability of adding gas exchangers to an existing installation can become a very complex problem. Conditions at the particular plant and station under consideration have a great deal of bearing on the outcome of such a study. The general points to consider are:

1. The amount of cooling necessary to give the desired dew point.

2. The temperature level at which this cooling must take place. (This is important because it may eliminate some other means of cooling the gas).

3. The effect of the exchangers on station horsepower and discharge gas cooling facilities — whether or not there is an excess of these facilities already installed.

4. The availability and cost of such other equipment as might reasonably be substituted for gas to gas exchangers.

5. Comparison of operating and maintenance costs of gas exchangers and any alternate proposals.

6. Dependability and uniformity of service.

7. Flexibility and simplicity of design.

As for new plant installations a further point must be investigated: namely, the comparative advantages of a glycol plant with gas-to-gas exchangers and a solid-type plant. However, let us not digress too far in the direction of general dehydration process designs. The important concept to retain is that the nature of glycol dehydration is such that a plant of this type may very possibly be modified to give better performance simply by incorporating a low-temperature-level heat exchange between the wet gas to the plant and a cooler suction-gas stream.

Consider next the suction gas as a coolant for the lube oil of a compressor engine. This form of oil cooling was first used on the compressor engines of a small field booster which was intended for automatic operation. Due to the scarcity of water and the fact that the installation was to be unattended, the booster unit was designed to eliminate all water-cooling-tower services. The jacket-water heat load, a quantity too large to dump into the gas stream, was dissipated by air coils, and the oil heat load, quite small in the case of the particular engines used, was picked up by the cold gas flowing to the engines. Fig. 5 shows the position of the cooler in the schematic layout of the unit.

Fig. 6 shows a sectional view of the

oil cooler used in the foregoing installation. A double-tube sheet arrangement was used as a safety precaution to obviate the possibility of gas leaking into the oil stream through the tube joints. A blowout head and automatic shutoff controls protected the installation from damage in the event of a tube rupture. Provisions were made to trap and vent off any gas that might seep through pinhole leaks into the oil, but this condition has never been encountered to date.

The question that arises, of course, is, "What about the effect on the horsepower requirements due to the higher suction temperature?" We know, from the basic theory of compression, that raising the temperature of a gas causes an increase in the horsepower required to pump a given quantity of the gas at a fixed compression ratio. The effect is undeniable, but the relative amplitude of the effect is the thing that is important. The amount by which the horsepower per million is increased is a deciding factor in determining the feasibility of such an installation. Referring to actual field data taken at the automatic station under discussion, a great deal of light can be thrown on the subject of temperature effect on horsepower.

Design Basis

The design basis for calculating the compressor horsepower assumed a 60° F. suction temperature. The actual suction temperatures encountered at the station are shown in Fig. 7. For 6 months of the year, the field gas reaches the station at temperatures below the 60° F. design level. During this period, the true horsepower needed to handle the station's load is less than the design figure. Throughout the year, the station operates at a compression ratio which is essentially constant at 1.5, and, under such operation, the observed increase in gas temperature across the oil cooler is 2° F. Applying this temperature correction to the basic horsepower per million figure, the increase due to the presence of the suction gas oil cooler is 0.3 per cent. For an installed horsepower of 300, this amounts to 0.9 hp. Even with the additional consideration of the pressure drop through the exchanger, which, incidentally, is slightly less than 1 lb., the horsepower chargeable to the oil cooler is about 1 hp. for a 300-hp. unit. At $210 per horsepower and $1,000 for the exchanger, this would amount to $1,210. Not only would comparable cooling facilities of a different type have been more expensive to install, but they would have also involved greater operating and maintenance expenses. The gas-oil cooler is ideally suited for automatic operation, whereas it is doubtful that a system using water or air as the cooling medium for the oil stream would lend itself to satisfactory unattended operation.

The same type of cooler has been applied to a main-line station with comparable results. The cooler has 0.7 sq. ft. of surface per horsepower being served, and the pressure drop on the gas side is 1.7 psi. at full capacity. Another interesting feature of this cooler is the dampening effect it exhibits on pulsations that would ordinarily exist in the station suction header. A marked decrease in the degree of pulsation is obtained in the suction header when this cooler is used.

In the case of the main-line-station oil cooler, the temperature rise of the suction gas is greater than the two degrees mentioned in the previous example. This is due to two factors: (1) type of engine used at the main-line station has a much higher heat load per horsepower; and (2) compression ratio at the latter station is somewhat higher, so that less gas is pumped per horsepower. The loss entailed by the elevated suction temperature can be plotted as a function of the compression ratio for a particular type of engine. Fig. 8 shows such a plot; the ordinate of the chart is the percentage increase in the horsepower per million above the basic horsepower per million with a 70° F. suction temperature. It should be kept in mind that the curve is not valid for all engines, but depends on the oil heat load of the type being discussed. This oil heat load may range from less than 100 to as high as 750 B.t.u./hp.-hour in commercial types of compressor engines. The curve shown in the diagram is based on a figure of 625 B.t.u. hp.-hour which is a normal value for several common makes of engines.

Referring to the diagram, let us determine the effect of the gas-oil cooler in a conventional design. On a main-line station of a system with a station spacing within the range normally encountered on gas-transmission lines, it is common practice to select horsepower on the basis of a 70° F. suction temperature. This represents approximately the maximum condition encountered throughout the year. A normal compression ratio for the station may be taken as 1.4 From the curve, the increase in horsepower per million due to a gas-oil cooler would be 1.38 per cent, but this loss would actually be realized from a design point of view only when the temperature of the gas from the cooler exceeded 70° F. In the case of a 1.4 ratio, this would correspond to a gas temperature of 60° F. to the cooler. If a weighted average were to be taken considering that part of the year when the incoming gas was below 60° F., the over-all loss would be about 0.6 to 0.7 per cent. Not only is this figure quite small, but it is within the degree of accuracy to which the engines can be indicated on load tests. Thus, the loss involved becomes a matter largely of academic interest insofar as it affects the necessary performance of the engine.

Summary

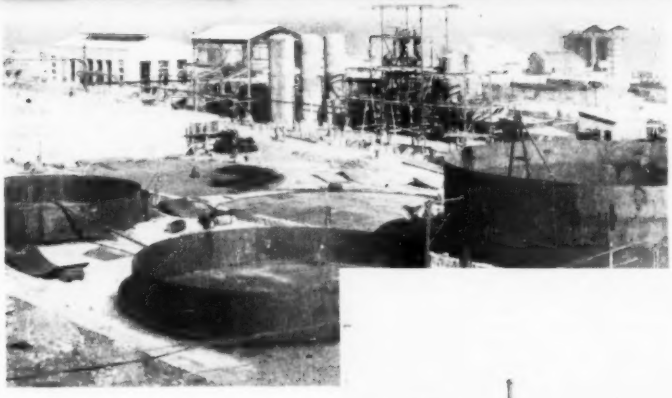
Summing up this application of gas cooling, it can be said that definite advantages can be obtained under the proper conditions by rejecting the oil heat load to the gas stream. This is particularly true when the problem of water scarcity is involved.

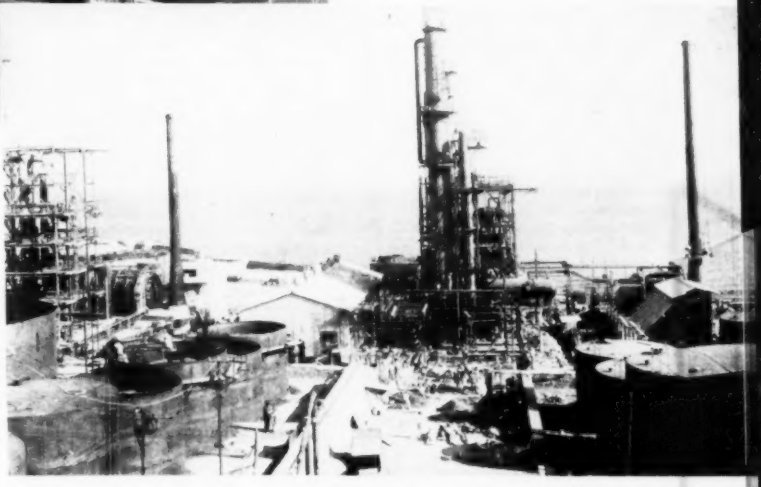
A third use of gas cooling was made by Panhandle Eastern in connection with the design of a small automatic field desulfurization plant to be installed on a well in Texas Panhandle field. The plant was to operate without an external supply of power. The major problems of circulating the amine solution was solved through the use of an alternately pressurized and vented dump tank, but the problem of interest to this discussion was the way in which the still overhead was to be cooled and condensed. Air cooling was considered as a possibility; natural convection and radiation to the atmosphere was one way of dissipating the heat. However, due to the wide seasonal variation in air temperature in that location, such a cooler would have to be designed for an extreme condition which might occur only for a short period of the year. When the air temperature dropped far below the maximum difficulties could be expected along with unnecessary overload on boiler.

In contrast to the greatly varying air temperature, the temperature of the gas from the well was low and practically constant throughout the year. This design advantage suggested the use of gas cooling, a solution that offered the further advantage of a heat-transfer rate corresponding to forced convection of the cooling medium. A small shell-and-tube exchanger was designed for the service and installed on top of the still. Several years of trouble-free operation have resulted; a side stream of sweet gas cools the still overhead and in turn rejects the heat to the ground through the pipe line.

The examples given here are only a few of the cases where the use of gas streams for cooling merit consideration. For instance, a possible application of this form of cooling has been suggested in conjunction with centrifugal compressor stations where a stream of seal oil must be cooled. Present trends in station and plant design make it necessary to re-evaluate the various solutions to the ordinary cooling problems. Progress is being made toward the simplification of heat-dissipation services.

Naturally, there is no universally complete answer to any general type of heat-load rejection—each individual case involves its unique circumstances which determine the most suitable and proper process for that particular job.





Construction scenes in the Tenerife refinery of Compania Espanola de Petroleos. Modernization and expansion of this plant is scheduled for early 1950

CANARY ISLANDS

Refinery Adding

Modern Lube-Manufacturing Facilities

EARLY in 1950 operations of the Tenerife refinery of Compania Espanola de Petroleos are scheduled to include production of lube oils by the latest processing methods. Now nearing completion at the plant located at Santa Cruz de Tenerife, Canary Islands, the lube-manufacturing facilities will have a finished-oil capacity of 400 bbl. daily. The various processes involved in the operations are propane deasphalting, furfural solvent refining, M.E.K.-benzol solvent dewaxing and clay percolation filtering. Both motor and aviation lubricants will be produced. A 5,000-bbl. per day atmospheric and vacuum distillation unit, now being erected, will supply the charging stocks.

Unlike most refineries, the Tenerife plant is designed for high flexibility in respect to crude-oil charging stocks. Processing arrangement of the refinery permits processing, with minor equipment adjustment, crudes from all parts of the world. Typical of the wide variety of crude oils which may be charged operations are those from the producing areas of:

Mexico—Tiber, Temblador, Panuco, Naranjo.

Middle East—Iraq, Damman, Alquaie, Kuwait.

U. S. A.—East Texas.

Venezuela—Boscan, Jusepin, Lagunillas, Light Oficina, San Joaquin.

Current crude-oil distillation capacity of the Tenerife plant is 10,000 bbl. daily. This capacity is expected to be increased by approximately 35 per cent in 1950, giving the refinery a nominal rating of 13,500 bbl. per day. Since 1936 when a new 5,000-bbl. per day Dubbs combination cracking unit was put on stream, the refinery's visbreaker, built in 1931, has been operated in crude-oil topping service. From time to time a 1,200-bbl. per day rerun unit, also built in 1931, has been operated to top crude oil. Because of the high demand on products from Tenerife, on stream efficiencies of the refinery's various units were maintained at a comparatively high figure. For example, figures on the visbreaker were 92 per cent with the rerun unit at 82 per cent and the Dubbs combination cracker 89 per cent.

Charge to the Dubbs unit has varied from 17° A.P.I. Lagunillas crude oil to 45° San Joaquin crude. The new distillation unit is designed to process crudes over the range from Lagunillas to 35° A.P.I. Damman oil. In addition to light, intermediate, and heavy fuels and lube oils, the refinery will produce wax and asphalt.

At present five pipe lines, each 3.5 miles long, are installed between the refinery and the harbor. Three of the lines are 10-in. and two are 8-in. Since the capacity of these lines will be inadequate to handle shipments when the new equipment is in operation, additional lines will be installed in 1950.

A propane fractionating unit, now in final stages of design, is scheduled for erection early in 1950. Construction on auxiliary facilities such as cooling towers, steam and electrical generators and blending and barreling equipment, is well advanced. Contractors on the major processing units and auxiliary equipment are:

Item—	Contractor
Atmospheric and vacuum distillation	Foster Wheeler
Propane fractionator	Universal Oil Products Co.
Propane deasphalting	Foster Wheeler
Furfural solvent refining	Foster Wheeler
MEK solvent dewaxing	Foster Wheeler
Percolation filtering	Company
Asphalt cutback	Cornell

Compania Espanola de Petroleos plans for future expansion include facilities for reforming and polymerization.

QUESTIONS on TECHNOLOGY

by W. L. Nelson
Consulting Engineer

Kauri Butanol Number

What is the Kauri Butanol Number of naphthas made from various crude oils? How can we relate it to other properties?—F. R. C.

Little is available regarding the relationship of K.B. number to other properties. For this reason the relationship between K.B. number and characterization factor had to be developed from the scant data of Tables 10 and 11 of the third edition of Petroleum Refinery Engineering; 10 samples from page 321 of the second edition of "Chemical Refining of Petroleum" by Kalichevsky & Stagner; and 16 samples from page 270 of E. B. Evans' "Petroleum Hydrocarbon Solvents" in Modern Petroleum Technology, 1946, of the Institute of Petroleum (London). The relationship developed is not exact (see Fig. 1) but it is better than appears to be available elsewhere. In summary, the relationship of K.B. number, characterization factor, and aniline point for fractions that boil at 225° and 350° F. is shown in Table 1.

TABLE 1—APPROXIMATE RELATIONSHIP OF KAURI BUTANOL NUMBER TO OTHER AROMATICITY FACTORS

		Aniline point, °C	
Characterization factor	K.B. number	225° F fraction	350° F fraction
10.5	90	12	20
10.75	70	20	27
11.00	57	28	34
11.25	48	35	41
11.50	42	42	48
11.75	37	48	55
12.00	33	53	62
12.25	31	58	68
12.50	30	63	74

The Kauri Butanol test consists of ascertaining the volume in cubic centimeters of the solvent which will cause sufficient opacity when added to 20 g. of standard Kauri solution (at 77° F.) to make 10-point type illegible when viewed through the flask—Baldeschwieler, Troeller, and Morgan, Ind. Eng. Chem., Anal. Ed. 7, 373 (1937). "Standard Kauri solution is prepared by adding 100 g. of carefully selected Kauri gum to 500 g. of n-butyl alcohol (distilling between 114.4° and 116.6° C.). The mixture is heated gently in a flask provided with a water-cooled reflux condenser, allowed to cool, and after 96 hours decanted into a clean, dry bottle always kept stoppered." The quality of Kauri gum varies and hence a correction must be applied. This is done by determining the "benzene equivalent" of the solution by titrating with benzene. The K.B. number obtained by experiment is corrected by dividing by the benzene equivalent of the particular Kauri solution and multiplying by 100.

Efficiencies Based on Gross And on Net Heating Values

NOTE: Last week R.G.R. bewailed the fact that thermal efficiencies are sometimes based on gross and sometimes on net heating values. Since no standard practice has been adopted by agencies or societies, all that is left to do is to provide the comparison given here, of efficiencies based on the two heating values.

The ratio of the gross to the net heating values is obviously related to the hydrogen content of the fuel, but this is not a convenient means of comparison because the hydrogen content is not ordinarily known. For this reason, the gross and net heating values were compared using gross heating values as the means of comparison. The relationship was found to be accurate within plus or minus about 5 per cent for ordinary fuels. The relationship between gross and net heating values is indicated in Table 1.

TABLE 1—APPROXIMATE RELATION OF GROSS TO NET HEATING VALUE

Gross H.V. B.t.u. per lb. or cu. ft.	Net H.V. B.t.u. per lb. or cu. ft.	Increase, % gross above net
9,000 lignite	8,400	7.15
11,000 lignite	10,480	4.95
13,000 bituminous	12,520	3.83
14,600 pure carbon	14,600	zero
15,000 coal and coke	14,560	3.02
16,000 bituminous and coke	15,500	3.22
18,000 oil fuels	17,100	5.26
20,000 kerosine	18,700	6.95
22,000 natural gas	20,400	7.85
23,000 hydrocarbon gases	21,000	9.50
21,000 cracked gases	19,150	9.65
150 producer gas	140	7.15
310 water gas	280	10.7
585 coke oven gas	520	12.5
325 pure hydrogen	275	18.2

The relationships of Table 1 were used to plot Fig. 1. The two extreme limits are (1) pure carbon because no water vapor is produced, and (2) pure hydrogen because only water vapor is produced. Thus, the gross and net heating values of carbon are the same, and for hydrogen the difference between the gross and net values is a maximum.

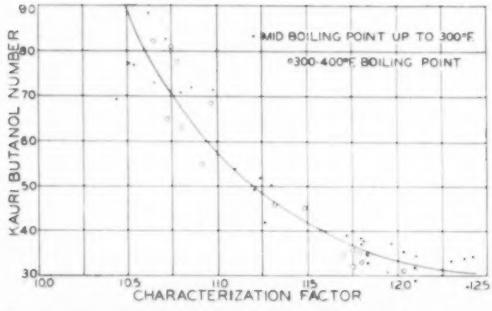


Fig. 1—Approximate relation of Kauri Butanol number to characterization factor

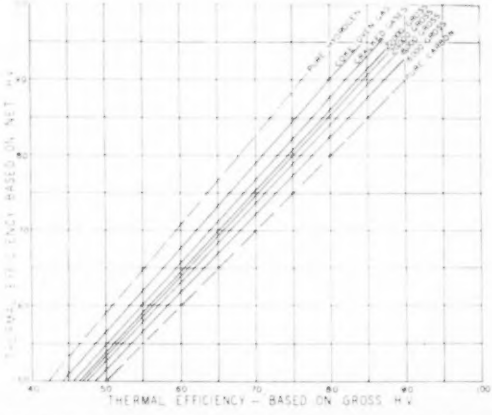
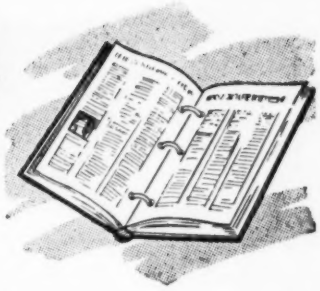


Fig. 1—Relationship of thermal efficiencies based on net and gross heating values

The Refiner's Notebook

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL



Reducing Storage Loss

TO determine the most economical storage installation a comparison can be made on the basis of annual cost per barrel of storage considering evaporation loss, possible changes in gravity or quality with resulting change in dollar value of product stored, and depreciation of storage facilities. The loss due to evaporation depends upon:

1. Vapor pressure, which is dependent on the temperature of the stock.

2. Surface area of liquid from which evaporation can take place.

3. Volume of vapor space above the liquid and daily variation in temperature of the vapor space.

4. Amount of air circulation in vapor space, which is dependent on type of roof, roof maintenance, and prevailing wind.

5. Volume of liquid pumped and frequency of pumping.

Some or all of the variables listed above are involved in preparation of charts from which evaporation losses may be predicted for a given type of storage. Tank designs which eliminate the vapor space, thereby eliminating breathing and filling losses and reducing windage loss, and vapor-saving systems which employ variable vapor-space devices have been discussed in previous numbers of the Refiner's Notebook.

Other means of reducing storage losses include restriction of air circulation through the vapor space of cone-roof tanks by providing gas-tight roofs and installations of properly selected conservation vents. Reduction of the daily variation in vapor-space temperature through the use of heat-reflecting paint on the roof is a simple and inexpensive way of obtaining additional reduction in evaporation losses.

Maintenance

Since the maintenance of storage tanks is not as critical a matter as it is for operating units there may be a tendency to neglect the storage facilities. Again, although pressure tanks and vapor-saving systems may of necessity receive some attention, maintenance of floating-roof and particularly fixed-roof tanks may be bypassed for long periods. In the interest of vapor conservation cone-roof tanks require particular attention as to tightness of roof, whether they are part of a vapor-saving system or not. Good practice calls for periodic roof inspection and openings along eaves and holes in roof should be looked for. Corrosion, as a rule, is apt to be most severe for roof plates.

Conservation vents and flame arrestors normally should be inspected once or twice a month. The pressure-vacuum vent pallets are lifted by hand at such time to check tendency toward sticking. During an extensive inspection, as when the tank is down for cleaning, pallet seats may be inspected for corrosion. In freezing weather it may be necessary to check the pallets daily. Practice sometimes calls for removal of pallets from vents of older design on tanks located in northern climates. An alternative to this practice is replacement with vents of newer design in which greater clearances between pallet stems and guides minimize tendency toward freezing. The tube bank of the flame arrestor requires inspection to see that the openings are not plugged with dirt or blocked by ice in freezing weather.

Table 1 summarizes savings made possible through the routine remedial measures of roof repair, installation of pressure-vacuum vents, and painting the roof with a free-chalking white paint. The data are from the evaporation loss committee of a major oil company. The operating conditions for which Table 1 were prepared are as follows:

Type and size of tank—cone roof—90 by 42 ft.
Days in service—365.
Tank throughput—46,200,000 gal. per year.
Average tank outage—24 ft.
Product R.v.p.—10 lb.
Average product temperature—61° F.
Pumping rate into tank—84,000 gal. per hour.
Product value—9.01 cents per gallon.

TABLE 1—EFFECT OF TANK REPAIR ON LOSSES

Tank condition:	Case I	Case II	Case III	Case IV
Type of roof construction	Gas-tight	Gas-tight	Gas-tight	Gas-tight
Condition of roof	Poor	Good	Good	Good
Type of vent	Open	Open	P/V	P/V
Type of appliances	Nongas-tight	Nongas-tight	Gas-tight	Gas-tight
Color and condition of roof paint	Needs Repainting	Needs Repainting	Needs Repainting	White-good
Condition of tank shell	Good	Good	Good	Good
Calculated loss—gal. per year:				
Windage	226,200	113,100	0	0
Breathing	0	0	75,400	50,250
Pumping	§46,300	74,100	77,150	77,150
Total	272,500	187,200	152,550	127,400
Per cent of throughput	0.59	0.41	0.33	0.28
Total est. repair costs over Case I—$	0	†1,250	‡2,100	2,500
Total value of savings over Case I—$/yr.	0	7,690	10,805	13,070
Total est. inc. maintenance cost over Case I—$/yr.	0	25	75	‡175
Total net savings over Case I—$/yr.	0	7,665	10,730	12,895
Payout—months	0	2	2.4	2.3
Marginal repair cost over preceding case—$		1,250	850	400
Marginal savings over preceding case—$/yr.		7,690	3,115	2,265
Marginal inc. in maintenance over preceding case—$/yr.		25	50	100
Marginal net savings over preceding case—$/yr.		7,665	3,065	2,165
Payout on marginal repair cost—mos.		2	3.3	2.2

*Covers the installation of an 18-in. strip around the roof circumference at the eaves. †Includes repainting the roof every 4 years. ‡Includes installation of 12-in. P/V vents, weighted gaging hatch, and S.&J. level indicator. §Predicted from chart and corrected for reduced hydrocarbon content of vapors due to poor roof condition and open vent.

No. 6 in current series of The Refiner's Notebook

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PIPE LINES

FPC Examiner Approves New York Natural-Gas Projects

Federal Power Commission Presiding Examiner Marvin Farrington has filed a decision, subject to review by the commission, authorizing construction and operation of pipe-line facilities which will carry additional natural gas for distribution in Oswego, Onondaga, Madison, Oneida, and Herkimer counties in New York.

The examiner's decision authorizes New York State Natural Gas Corp., New York City, to install and operate a measurement station in Onondaga County and to sell and deliver additional natural gas to Niagara Mohawk Power Corp. Estimated cost of these facilities is $32,000.

Niagara Mohawk was authorized to construct and operate 16 miles of 14-in. loop line extending from New York State Natural's proposed measurement station to a connection with Niagara Mohawk's existing system near Syracuse. The company estimates cost of this line at $892,000.

Texas Eastern Directors Hold Meeting in Houston

Texas Eastern Transmission Corp. earned a net income of $7,378,313 in 1949, according to a report presented to a meeting of the board of directors of the Big Inch pipe line held in Houston recently. The income figure, which amounts to $1.58 per share of stock outstanding, compares with $5,433,143, or $1.18 per share, earned in 1948, the report revealed.

Following the presentation of the report the directors declared a stock dividend of one additional share for each 16 shares of stock outstanding, payable March 31, 1950, to stockholders of record, March 1, 1950. George R. Brown, chairman of the board, stated that the directors wished to afford stockholders the advantages of an immediate distribution of a portion of the earnings for the year, and at the same time conserve the company's cash, with a view particularly to expenditures which are anticipated in 1950 in connection with preliminary work on its expansion plans to serve the New England area.

Brown stated that the board felt that cash dividends could reasonably be expected to commence early in 1951, since the current construction program and the preliminary expenditures in connection with the New England expansion would both be completed in 1950. Present trends indicate earnings for 1950 of approximately $2 per share, he said.

Contracts Let for New Gas Line in Tennessee Area

A contract has been signed for construction of a $11,640,000 natural-gas pipe line in Tennessee.

Oman Construction Co., Nashville,

Construction of two 12-in. lines across the Arkansas River, near the Mid-Continent Petroleum Corp. refinery, being built for Great Lakes Pipe Line Co.'s 12-in. products line from Tulsa via Barnsdall, Okla., to Kansas City under contract by Pacific Pipe Line & Engineers, Ltd.

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Fort Madison, Iowa

and the N. A. Saigh Co., San Antonio, were awarded the contract, and will share "fifty-fifty" in construction of East Tennessee Natural Gas Co.'s line, Wade Thompson, Nashville, president of the gas company, said.

Products Flow Into Pipe Lines Up 11 Per Cent

The U. S. Bureau of Mines reported that volume of the three principal refined petroleum products handled by pipe lines during the first 11 months of 1949 ranged up to 11 per cent higher than in the same period during 1948.

Products deliveries from lines in the period totaled 313,061,000 bbl., an increase of 31,998,000 bbl., or 11.4 per cent from the same period a year ago.

Products turned into the lines during the same period amounted to 314,798,000 bbl., up 29,887,000 bbl., or 10.4 per cent from the first 11 months of 1948.

Products deliveries from lines in November totaled 30,367,000 bbl., an increase of 3,547,000 bbl., or 13.3 per cent over the same month a year ago.

Products turned into lines in November amounted to 30,535,000 bbl., up 3,183,000 bbl., or 11.5 per cent from November 1948.

H. C. Price Co. Sets Up Profit-Sharing Plan

H. C. Price Co. has established a profit-sharing plan for which salaried employes qualify after 10 months' continuous service.

Upon termination of employment, money in the individual's account in the Employe's Trust fund is available for withdrawal. Accumulated funds credited to the employe are also accessible to him in financial emergencies.

The Price company has arranged to deliver 7½ per cent of its net earnings to the Employes Trust, operated by agreement with the First National Bank, Bartlesville, Okla. The advisory committee for the trust consists of three company officials: C. S. Le Noir, J. P. Neill, and E. L. Gallery.

Office Building Planned

Transcontinental Gas Pipe Line Corp.'s subsidiary, the Transcontinental Building Corp., is preparing for the letting of contracts for construction of an office building to cost from $750,000 to $1,000,000 on a tract fronting on Travis and Milam streets between Elgin and Rosalie streets, Houston.

Additional pipe-line news will be found following the Pipe-Line Construction feature on page 101.

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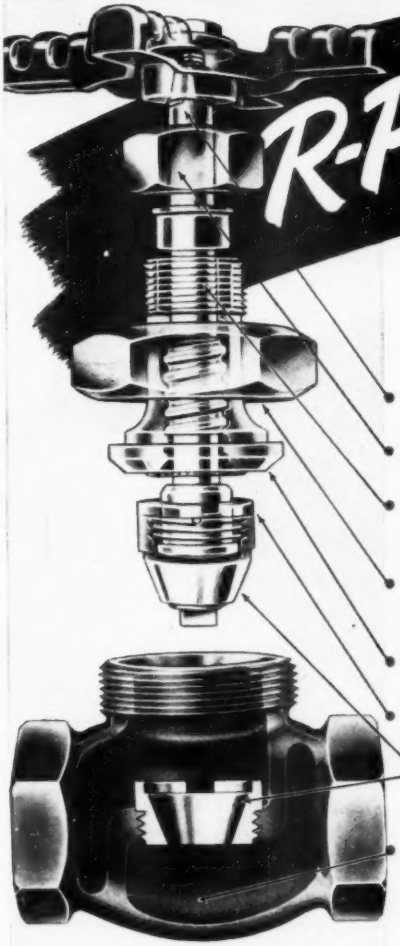

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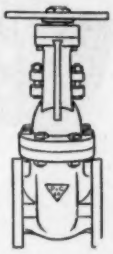

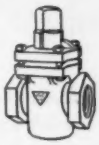

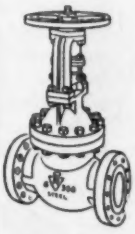

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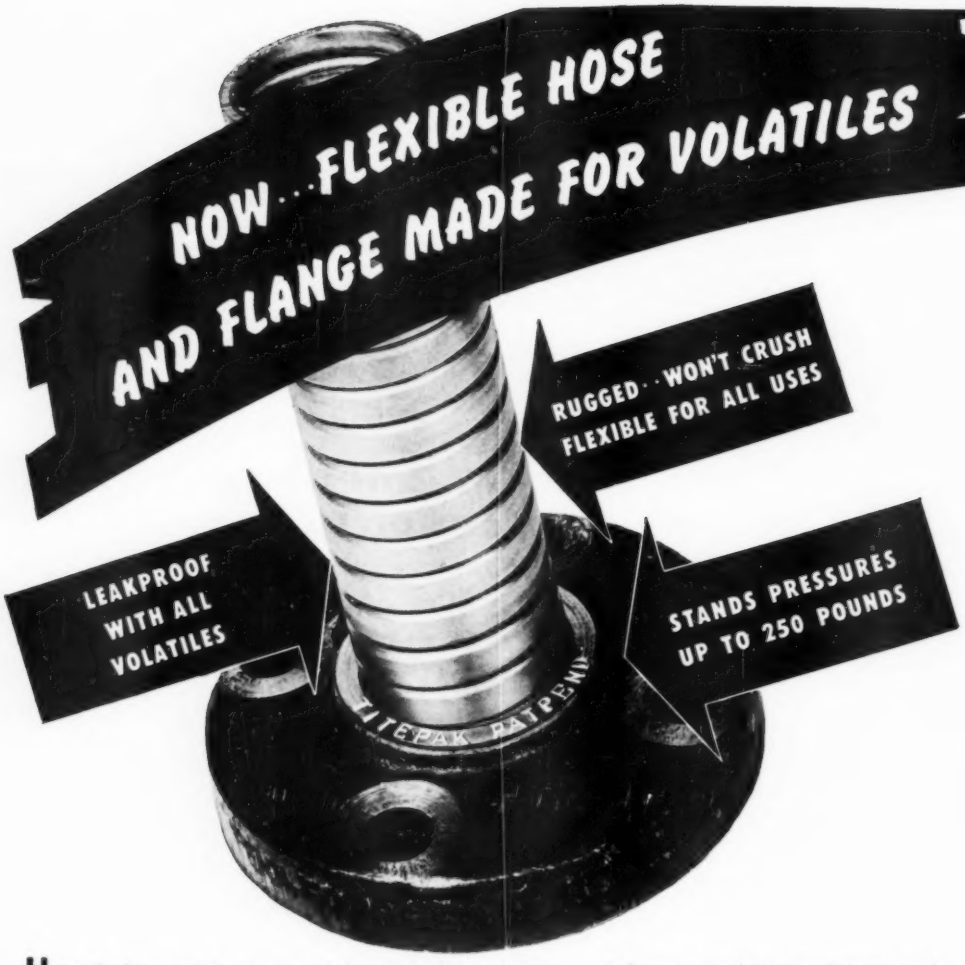

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Pipe-Line Construction

FOLLOWING is a tabulation of pipe-line projects, both domestic and foreign, which are planned or under construction. Included are crude-oil, products, and natural-gas lines. The list was compiled from surveys made by The Oil and Gas Journal.

Crude-Oil Pipe Lines—Domestic

Humble Pipe Line Co.—371 miles, 18-in., under way, West Texas-Satsuma Station to Baytown, Tex.; 178-mile western section contracted to Morrison Construction Co.; 193-mile eastern section contracted by Anderson Brothers Corp.

Mid-Valley Pipe Line Co. (Sun and Sohio)—1,000 miles, 20-22-in., under way, Longview, Tex., to Mayersville, Miss.-Covington, Ky., to Lima, Ohio. Contracts let for 857 miles as follows: Section 2, Haynesville, La., to Mayersville, Miss., Latex Construction Co.; spread office, Farmerville, La.; F. A. Silar, general superintendent; W. A. Briley, spread superintendent; office at Haynesville, La., W. H. Hayes, superintendent; M. L. Thompson, assistant superintendent. 41 miles, 12-in., lateral, Delhi to Lake Providence, La.; headquarters, Lake Providence; E. C. Norris, general superintendent; R. E. Thornton, superintendent. Section 3-A, Mayersville to Oakland, Miss., Associated Pipe Line Contractors, Inc.; J. A. Williams and L. H. Gray, spreadmen; Section 3-B, 4-A, Oakland, Miss., to Henderson, Tenn., Eastern Construction Co.; Section 4-B, 5-A, Henderson to Clarksville, Tenn., Eastern Construction Co.; Section 5-B, 6-A, Clarksville, Tenn., to Elizabethtown, Ky., field office, Clarksville, Tenn., Fred L. Byers, superintendent; Britton Construction Co.; Section 6-B, 111 miles of 22-in., Elizabethtown to Hebron, Ky., H. L. Gentry Construction Co., Frank Morris and Jim Mitchell, spreadmen; Section 7 South, Hebron, Ky., to Eaton, Ohio, Britton Construction Co., field office, Hamilton, Ohio; spreadman, Fred Peters; Section 7 North, Eaton to Lima, Ohio; Section 8, Magnolia, Ark., to Haynesville, La.

Cumberland and Tennessee rivers, Eastern Construction Co.; field office, Clarksville, Tenn., Fred L. Byers, spreadman.

Naph-Sol Refining Co.—25 miles 6-in., under construction, Kimball Lake oil field, Newaygo County, Michigan, to refinery at Muskegon; Young Construction Co., Olney, Ill., contractor.

Pasotex Pipe Line Co.—32 miles 4-8-in., authorized, North Snyder, Tex., lines for gathering, delivery to Basin System.

Portland Pipe Line Co., Montreal Pipe Line Co., Ltd.—236 miles, 18-in., planned, Portland, Me., to Montreal, Que., Canada, contracted as follows: Oklahoma Contracting Co., 85 miles in Section 1 at southern end; Portland, Me., to Gorham, N. H. Associated Pipeline Contractors, Inc., Section 2, 81 miles; and Fred Mannix Co., Ltd., 68 miles, Section 3, in Canada.

Richfield Oil Corp.—40 miles, 10-in., Cuyama Valley-Newhall, Calif., planned; Bechtel Corp., contractor; central plant, Watson, Calif., 60 miles, 14-in., applying field joints, Newhall-Wilmington, Calif.; under way; Bechtel Corp., contractor.

Texas-Empire Pipe Line Co.—42 miles, 16-in., authorized, Wilmington, Ill., to East Chicago, Ind.; O. E. Burden Construction Co., contractor.

Products Pipe Lines—Domestic

Great Lakes Pipe Line Co.—261 miles, 12-in., under way; contracted as follows: 52 miles, 15-in., Albert Lea to Fairbault, Minn.; under construction; Sheehan Pipe Line Construction Co., contractor; field office, Albert Lea, Minn.; C. W. Henderson, spreadman. O. R. Burden Construction Co., 64 miles north from Des Moines; field office, Nevada, Iowa; G. D. Lewis, spreadman; A. C. Holder Construction Co., 72 miles to Iowa-Minnesota state line; Williams Brothers Corp., 20 miles, Mississippi River crossing and line to terminal and station. Kansas and Missouri river crossings, R. H. Fulton & Co.; field office, Kansas City; Ed Veach, spreadman.

290 miles, 12-in., Tulsa to Kansas City, Mo. Contracted as follows, for completion March 1: 54 miles, Ponca City to Barnsdall, Okla., O. R. Borden Construction Co.; and 236 miles, Barnsdall, Okla.-Kansas City, Mo., Pacific Pipe Line & Engineers, Ltd. James Howe, superintendent for Pacific Pipe Line portion is headquartered at Chanute, Kans.; spread office at Tulsa with Ham Hamilton general spreadman and river-crossing spreadman; spread office at Dewey, Okla., Loue Robertson, spreadman; and spread office at Paola, Kans., Larry Webb, spreadman.

355 miles, 12-in., authorized, Kansas City through Omaha and Sioux City, Iowa, to Sioux Falls, S. D.

189 miles, 12-in., authorized, Kansas City to Des Moines.

50 miles, 8-in., authorized, Cushing-Drumright-Tulsa, Okla.

Phillips Petroleum Co.—155 miles 6-in., extension to present 200-mile line from Phillips, Tex., to LaJunta, Colo., on to Denver.

Standard Oil Co. (Ohio).—38 miles 8-in., authorized, Toledo to Fostoria, Ohio.

Salt Lake Pipe Line Co.—242 miles, 6-8-in., Boise, Idaho-Pasco, Wash., planned. Contracted as follows: Morrison-Knudson Co., Inc., Macco Corp., and Bechtel Corp., section from Boise to Baker, Idaho; Pacific Pipeline & Engineers, Ltd., Baker to Pasco, Wash.

Natural-Gas Pipe Lines—Domestic

Alabama-Tennessee Natural Gas Co.—80 miles 10-in., under way, Selmer, Tenn., to Muscle Shoals, Ala.; 35 miles 8-in., authorized, Muscle Shoals to Decatur, Ala.

Algonquin Gas Transmission Co.—276 miles, Lambertville, N. J., to Boston area, proposed.

492 miles laterals, New England area, proposed.

Atlantic Gulf Gas Co. (United Gas Pipe Line Co.)—1,530 miles, planned, Alabama-Florida-Georgia-South Carolina.

Central Hudson Gas & Electric Corp.—40 miles, authorized, Tuxedo, N. Y., station, Home Gas Co. line now under construction, to Poughkeepsie, N. Y.

Central Kentucky Natural Gas Co.—36 miles, 12-20-in., planned, Kentucky loops.

Chicago District Pipe Line Co.—41 miles, 24-in., planned, Joliet, Ill., to Chicago.

City of Indianapolis, Ind., Inc.—55 miles 16-in., proposed, Indianapolis to Texas Eastern Transmission Corp.'s system.

Cities Service Gas Co.—47 miles, 3-4-16-in. planned, in Kansas.

Coastal Pipe Line Co.—1,000 miles, planned, Texas to Norfolk, Va.

Colorado-Wyoming Gas Co.—41 miles, planned, Greeley, LaSalle, and Windsor, Colo., areas.

Commonwealth Natural Gas Corp.—537 miles, 20-in., planned, West Bend, Ky., to Norfolk, Va.

200 miles, planned, Green County, Virginia, to Norfolk.

East Tennessee Natural Gas Co.—185 miles, 16-in., Lobelville-Chattanooga, Tenn., contracted by Walters & Saigh Construction Co., for construction in 1950; 120 miles, 12-in., Chatanooga-Knoxville, Tenn.; contracted by Walter and Saigh Construction Co., for construction in 1950; 100 miles of laterals to be laid in 1950. Con-

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struction 150 miles, 16-in., Knoxville-Bristol, Tenn., under consideration.

El Paso Natural Gas Co.—All work done by company crews.

Looping of 26-in., New Mexico-California line and connection with Pacific Gas & Electric Co. at Needles, Calif. 352 miles, 30-in., completion November 1950.

450 miles, 30-in., under construction, Eunice, N. M.-Blythe, Calif., looping; completion March 1950.

450 miles, 24-in., planned, San Juan basin, New Mexico to Franconia, Ariz.

Home Gas Co.—70 miles, planned, Orange, Sullivan-Rockland counties, New York-Cattaraugus County, New York, areas.

Jersey Central Power & Light Co.—39.4 miles, 10-in., planned, New Jersey to Coast system, Texas Eastern Transmission Co.'s Big Inch.

Michigan-Wisconsin Gas Co.—185 miles, 4-14-in. laterals, Milwaukee-Fond du Lac, Sheboygan, and Green Bay, Wis., under construction; C. C. Griffis Construction Co., contractor; Paul Means, superintendent for Lake Del Mort crossing.

Montana-Dakota Utilities Co. and Montana-Wyoming Gas Pipe Line Co.—340 miles, 12¾-in., planned, Worland, Wyo., to Cabin Creek, Mont.

Montana Power Co.—83 miles, 12¾-in., planned, Butte to Bozeman, Mont.

New York State Natural Gas Corp.—53½ miles 16-in., loops, Pennsylvania.

Northeastern Gas Transmission Co.—511 miles, up to 20-in., planned, in New England area.

Northern Natural Gas Co.—41 miles, 20-in., under construction, Southwest from Garden City, Kans.; R. H. Fulton & Co., contractor.

597 miles of looping in 10 sections, contracted as follows: R. H. Fulton & Co., loops 1 to 5: loop 1, 40.2 miles, 26-in., extending northward from a point 28.7 miles north of Skellytown station in Pampa, Tex., area; loop 2, Beaver, Okla., station, 74.9 miles, 26-in.; loop 3, Mullinville, Kans., station, 33¼ miles, 26-in.; loop 4, Bushton, Kans., station, 73½ miles, 26-in.; loop 5, from a point west fo Garden City, Kans., to Bushton, Kans., station, 155 miles, 20-in. Midwestern Constructors, Inc., loops 6 and 7; loop 6, from a point 29 miles northeast of Palmyra, Nebr., station, 43.4 miles, 26-in., to Oakland, Iowa, station; loop 7, from a point 17.8 miles northeast of Oakland, Iowa, station, 65.9 miles, 26-in. R. B. Potashnick, loops 8 to 10: loop 8, southwestward from Ventura, Iowa, station, 31.2 miles, 26-in.; loop 9, northward from Ventura station, 41 miles, 26-in.; loop 10, from the north end of a 26-mile gap beyond loop 9, where another loop will be built consisting of 39½ miles, 26-in.

Northwest Natural Gas Co.—750 miles planned; Washington, Oregon, and Idaho.

Pacific Gas & Electric Co.—506 miles, 34-in., under construction, Topock, Ariz.-Milpitas, Calif.; Bechtel-Price-Conyes, contractor; spread office; R. L. Bowman, general superintendent.

Panhandle Eastern Pipe Line Co.—356 miles, 26-in., authorized, looping in Texas, Oklahoma, Kansas, Missouri, Illinois, Indiana, Ohio, and Michigan.

Peoples Gas Light & Coke Co.—Planned 42 miles, 24-in., Joliet-Chicago, Ill.

Phillips Petroleum Co.—25 miles gathering system in West Edmond, Okla., field, under construction; Vaughn & Taylor Construction Co., Inc., contractor; spread office Edmond, Okla.

Piedmont Natural Gas Corp.—1,350 miles, 20-in., planned, Greenville, Miss., to Norfolk, Va.

Plains Natural Gas Co.—78 miles, gathering system, Oklahoma-Kansas area, Hugoton field. Contracted by: Arey-Phillips Construction Co., Amarillo, Tex.; Tulsa Pipe Coating Co., Mid-Western Constructors, Inc., Engineering and supervision. Latter firm represented by Lyle DeWitt.

South Jersey Gas Co.—77 miles, planned, Camden to Atlantic City.

Southern Natural Gas Co.—138 miles, 20-22-in., planned, Chattanooga, Tenn., to Lexington, Miss.

375 miles, 24-in., planned, Gwinville, Miss., to Atlanta.

225 miles, 16-in., planned, Colfax, Ga., extension.

110 miles, 11-in., considered; extension.

314 miles, 18-in., planned; extension.

171 miles, 16-in., planned; extension.

118 miles, 13-in., planned; extension.

Southern Union Gas Co.—78 miles, 8-10-14-in., planned, New Mexico loops and laterals.

Tennessee Gas Transmission Co.—65 miles, 16-in., planned, Ohio-Pittsburgh spur.

790 miles, 20-26-in., planned, Burnaugh, Ky., to Boston, including 400-mile line to Buffalo.

992 miles, 30-in., planned, first 150 miles of loops to be laid at Monroe, La., Greenville, Miss., Midland and Portland, Tenn.

54.2 miles, 30-in., under construction, White Bluff area to Joelton, Tenn., area, contracted to Morrison Construction Co.

36.1 miles, 30-in., under construction, Glasgow, Ky., area to Joelton area, contracted to Morrison Construction Co.

18.1 miles, 30-in., under construction Union City to Buckeye, Ky., Anderson Brothers Corp., contractors.

27.7 miles, 12-in., under construction, El Campo, Tex., to near Traitor, Tex.; Massey Construction Co., contractor.

25 miles, 30-in., Hardeman and McNairy counties, Tennessee; H. C. Price Co.; field office, Selmer, Tenn.; J. A. Reutzel, spreadman.

70 miles, 26-30-in., between stations 104 and 110; Anderson Brothers Corp.; field office, Richmond, Ky.; E. C. McCoy and Arkie Hobson, spreadmen.

170 miles of 26 and 30-in., contracted by Anderson Brothers Corp., in Kentucky.

Texas-Eastern Transmission Corp.—1,400 miles planned, Texas to Pittsburgh loops.

108 miles 16-in., authorized, Provident City to Baytown, Tex.

Texas Gas Transmission Corp.—103 miles, 20-in., Carthage, Tex., to near Lisbon, La., (Sharon); under construction; N. A. Saigh Co., Inc., contractor; Carthage, Tex.; Bob Floyd, representative. Construction subcontracted: (1) Fowler Brothers, 43 miles from Carthage to Red River, field

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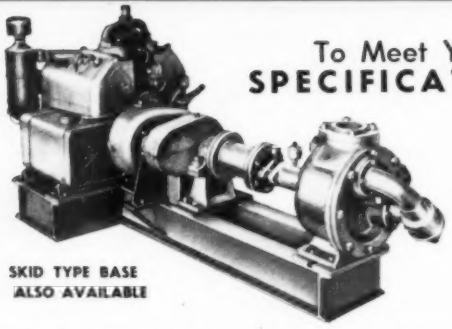

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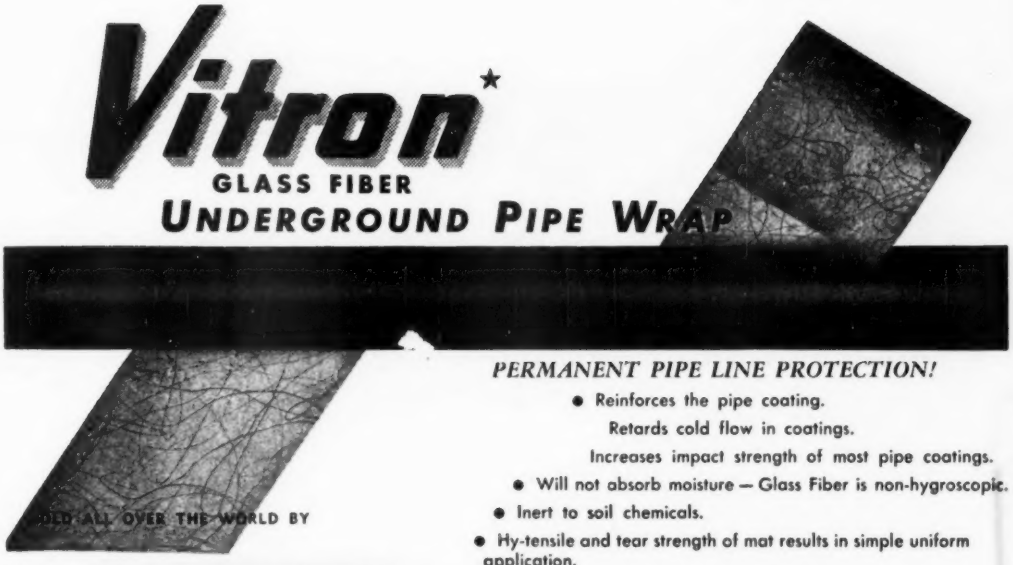

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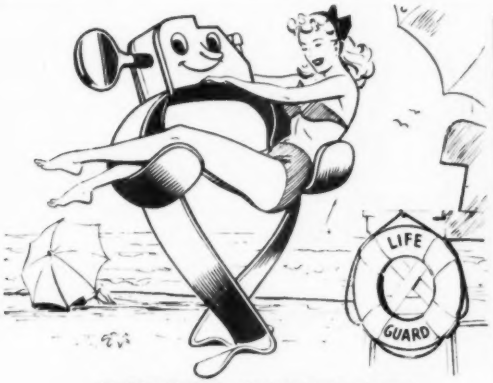

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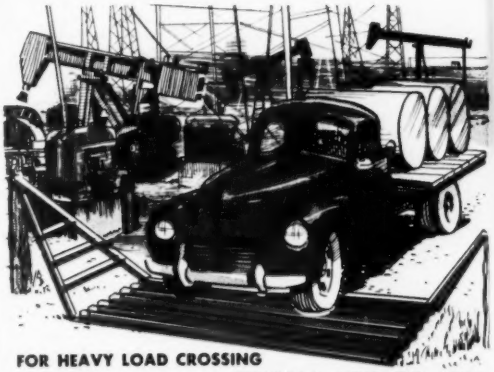

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office at Carthage; M. C. Johnson, spreadman; (2) 63 miles to Sharon station, Oklahoma Contracting Co. (J. R. Horrigan) field office at Minden, La.; Ed Flanagan, spreadman.

32 miles, planned, Slaughters, Ky., to Evansville, Ind.

Texas Illinois Natural Gas Pipeline Co.—1,400 miles, 30-in., planned, La Gloria field, Texas, to Joliet, Ill.

58-mile, 20-in. lateral, Joliet terminal to connection with Natural Gas Pipeline Co. of America near Volo, Ill.

Transcontinental Gas Pipe Line Co.—Texas-New York 1,840 miles, 30-in., main line and 500 miles, 4 to 22-in., gathering line. Section of 605 miles of 30-in. nearing completion.

Section (unnumbered), Rio Grande Valley to Eunice, La., 502 miles; contracts not let. Section 6, Newman, Ga., to Danielsville, Ga., 108 miles; Williams Brothers Co.; field office, Monroe, Ga.; Thelmer Davis, spreadman. Section 7, Danielsville, Ga., to Saluda River, South Carolina; 86 miles; Williams Brothers Co. Section 8, Saluda River, South Carolina, to Catawba River, North Carolina, 102 miles; R. H. Fulton & Co. Section 9, Catawba River, North Carolina, to North Carolina-Virginia boundary, 100 miles; R. H. Fulton & Co. Section 10, North Carolina-Virginia boundary to James River, Virginia; 86 miles; O. R. Smith Contracting Corp. Section 11, James River, Virginia, to Potomac River, Virginia; 110 miles; O. R. Smith Contracting Corp. Section 12, Potomac River, Virginia, to Susquehanna River, Pennsylvania, 76 miles; Associated Engineers & Contractors, Inc. Section 13, Susquehanna, Pennsylvania, to Delaware River, 90 miles; Wunderlich & Griffis Construction Co. Section 14, Delaware River to Hackensack River, New Jersey, 61 miles; Wunderlich & Griffis Construction Co Section (unnumbered), Hackensack River, New Jersey, to Hudson River, New York, 23 miles; Oklahoma Contracting Co.; field office, Edgewater, N. J.; M. E. Shiflett, spreadman.

Trunkline Gas Supply Co.—1,775 miles, 10-26-in., planned; includes 740-mile, 26-in main line from Lake Charles, La., to Tuscola compressor station on Panhandle Eastern Pipe Line Co., and 1,035 miles, 10-24-in. Lake Charles, La., to McAllen, Tex., field lines, pending FPC approval of changed plans.

United Fuel Gas Co.—32 miles, 20-in., authorized; Roane, Calhoun, and Wetzel counties, West Virginia.

United Gas Pipe Line Co.—90 miles, 16-in., planned, West Bay field to New Orleans.

105.6 miles, 20-in., authorized, loop line paralleling Carthage, Tex.-Sterlington, La., and extending on to near Monroe, La.

26 miles in Louisiana conecting with East Texas system, planned.

United Natural Gas Co.—29 miles, 12-in., authorized, laterals, Elk County, Pennsylvania.

Virginia Natural Gas Co.—153 miles, planned, Buckingham to Richmond and Portsmouth, Va.

Crude-Oil Pipe Lines—Foreign

Interprovincial Pipe Line Co. (Imperial)—1,150 miles, 16-20-in., Edmonton area, to Superior, Wis.; contracted as follows: 480 miles, 20-in., Edmonton-Regina, Canadian-Bechtel, Ltd., associated with Fred Mannix Co., Calgary, Alta.; 340 miles, 16-in., Regina to Gretna, Man., Williams Brothers Corp.; 360 miles, 18-in., Minnesota and Wisconsin, Anderson Brothers Corp. (Lake Head Pipe Line Co., Inc.).

Iraq Petroleum Co., Ltd.—620 miles, 16-in., Kirkuk-Haifa, Palestine, shut down.

556 miles, 30-32-in., planned, Kirkuk, Iraq-Banias, Lakatia (Bechtel).

Middle East Pipe Line Co.—800 miles, 34-36-in., planned, Iran-Levantine Port.

Montreal Pipe Line Co., Ltd.—(See Portland Pipe Line Co. item in domestic crude oil list.)

Petroleos Mexicanos—280 miles, 12¾-in., authorized, Poza Rica to Salamanca, Mexico.

Santos Jundial Railroad—30 miles, 18-in., planned, Santos to Sao Paulo, Brazil.

Trans-Arabian Pipe Line Co.—1,067 miles, 30-31-in., under construction, Abqaiq, Saudi Arabia, to Sidon, Lebanon; **International** Bechtel, Inc., Williams Brothers Corp., Graver Tank & Mfg. Co., and Chicago Bridge & Iron Co., contractors.

Yacimientos Petroliferos Fiscales de Argentina.—25 miles, under way, Tupungato-Lujan de Cuyo.

409 miles, under way, Plaza Huincul-Bahia Blanca.

Products Pipe Lines—Foreign

Petroleos Mexicanos.—160 miles, 10¾-in., authorized, Minatitlan to Salina Cruz, Mexico.

Cia. des Pipe Lines Petroliers Francias.—150 miles, 10-in., planned, Le Havre to Paris, France.

Colombian Government.—268 miles, planned, Puerto Berrio to La Dorada, 90 miles; Puerto Berrio to Medellin, 103 miles; Buena Ventura to Cali, 75 miles.

Northern Pipe Line, Ltd.—300 miles, 10-in., planned, Montreal to Toronto, Canada.

Santos Jundial Railroad.—40 miles, 10-in., planned, Santos to Sao Paulo to Campinas, Brazil.

Natural-Gas Pipe Lines—Foreign

Direccion General del Gas del Estado.—310 miles, planned, Plaza Huincul to Neuquen, Argentina, to the vicinity of General Conesa, Argentina.

62 miles, Comodoro Rivadavia to Caleto Olivia, under way.

Northwest Natural Gas Co.—950 miles, 24-in., planned, Alberta fields to Vancouver, B. C., Seattle, Wash., and Portland, Ore.

Petroleos Mexicanos.—205 miles, 16-in., considered, Monterrey to Torreon, Mexico.

260 miles, 20-in., considered, Monterrey-Tampico-Poza Rica area, Mexico.

Petroleos Mexicanos, Mexican Gas Co., and Industrial Gas Co.—600 miles, planned, Reynosa, Tamaulipas to Mexico City, D. F., Mexico.

Westcoast Transmission Co., Ltd.—1,406 miles, 30-in., planned, North Alberta, Vancouver, B. C., and northern California.

Western Pipe Lines.—710 miles, 22-24-in., planned, Alberta fields, Saskatoon, Alta., to Winnipeg, Man., Canada.

Aluminum Gas Line Contracted in Alabama

An aluminum gas line will extend approximately 1.8 miles from the main trunk line of the Alabama-Tennessee Natural Gas Co. to Listerhill, Ala., plant of Reynolds Metals Co. Construction has been contracted by Lehman Hoge & Scott, Sheffield, Ala.; the aluminum line will be owned by the Alabama-Tennessee Natural Gas Co.

The aluminum line consists of extruded (not drawn) type 63S-T6 aluminum-alloy pipe measuring 8⅝-in. o.d., with ¼-in. wall., designed for a working pressure of 200 psi., and a bursting pressure of 1,750 psi.

Ends of the 40-ft. joints will be prepared for welding by a 30° bevel at the mill. The weld will be made with two passes, using ⅛-in. diameter 5 per cent silicon-type aluminum rod. No flux will be employed since the Heliarc method will be used. This system provides a complete shield of inert gas around the weld zone.

A 300-ampere portable Hobart Heliarc welder will be used.

The entire length of the line will be protected by applying No-Oxid, except a single 40-ft. section which will be left unprotected to determine if protection is necessary. This section will be bypassed with another length of pipe which will be protected. Valves will disconnect the unprotected section from the line and allow the gas to flow through the bypass.

It is planned to dig up the unprotected section of the line at 6-month intervals to examine. Some experimental work has indicated that the protection of the alminum pipe may not be necessary.

Standard Oil Co. (Ind.) Builds New Pump Stations

Standard Oil Co. (Ind.), products pipe-line department, has added three pump stations. Two stations built in the last half of 1949 by the company's construction organization are the Burlington Junction booster station in Missouri and the Oregon booster station near Oregon, Ill. The Whiskey Creek booster station near Sioux City, Iowa, finished in January, was built partly by the company's construction organization and partly by contract work let to Nystrom Electric Co. and W. A. Klinger Co. A dehydration plant at Whiting has been built to serve the company's northwestern line.

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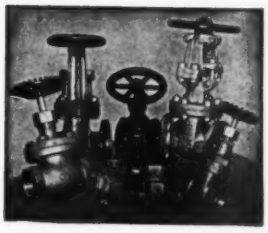

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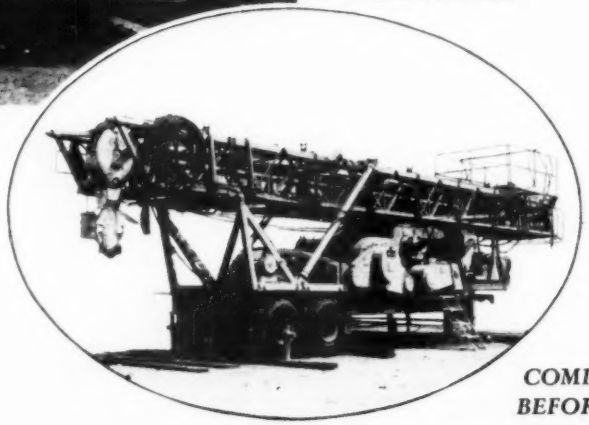

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NATURAL GAS

El Paso-Delhi Agreement Contingent Upon Line O. K.

The purchase by El Paso Natural Gas Co. of approximately 14,000 acres in San Juan basin leases from Delhi Oil Corp. for an initial $3,000,000 is subject to the Federal Power Commission's granting permission for El Paso to construct a natural-gas line from the basin area to a point on the Colorado River south of Needles, Calif., Paul Kayser, Houston, El Paso president, said last week. Hearing has been set to begin before FPC on April 17.

Announcement of El Paso's purchase of the leases *(The Oil and Gas Journal, January 26, 1950, page 164)* disclosed that the 14,000 acres involved are located in the Barker Dome area of northern New Mexico and southern Colorado; that three high-pressure gas wells are on the leases; and that another is being drilled. If FPC approves the line, four additional wells will be drilled, Kayser said.

Kayser said the pipe line would serve various towns in New Mexico and Arizona, and also permit delivery of 150,000,000 cu. ft. of natural gas daily to Pacific Gas & Electric Co. for distribution in the San Francisco Bay area.

For Peak Demands

The Barker Dome properties will be used primarily to cover peak deliveries in the winter season, Kayser said, and would permit El Paso to market additional quantities of gas from the Permian basin area of West Texas.

The contract with Delhi provides that upon completion of the pipe-line outlet El Paso may take an average daily maximum of 110,000,000 cu ft. of treated gas, and must take or pay for an average daily minimum of 60,000,000 cu. ft. After 2 years of deliveries, if an engineering study indicates there is sufficient gas to deliver 110,000,000 cu. ft. for 25 years from the date of first delivery, then the daily minimum take is to be increased to that volume. In that event El Paso is to pay Delhi an additional $2,000,000.

The contract further provides that Delhi is to construct a natural-gasoline plant, paying El Paso 10 per cent of gross sales of all liquid hydrocarbons extracted. At the end of 2 years, El Paso has the option to acquire the plant with Delhi thereafter to receive 20 per cent of the gross sales from the plant. El Paso will drill the additional wells required, construct a gathering system and gas purification plant, and will operate all facilities but the gasoline plant.

Tennessee Gas Transmission Application Is Dismissed

An application filed by Tennessee Gas Transmission Co. for permit to construct facilities to increase capacity of the pipe line connecting its transmission line in Louisiana with the Carthage, Tex., gas field, has been dismissed by Federal Power Commission.

The company now has a contract with United Gas Pipe Line Co. for the latter firm to transport over its Carthage line approximately 110,000,000 cu. ft. of gas daily for Tennessee.

FPC found, in dismissing the application, that since United stated it had no intention of canceling the contract, the commission would be unable to make the requisite statutory finding that Tennessee is "able and willing properly to do the acts and to perform the service proposed." Included in Tennessee's proposal was the construction of 24 miles of 30-in. loop line. The contract with United, dated November 1, 1945, will remain in force 20 years.

Committee Is Appointed to Revise A.G.A. Constitution

Eskill I. Bjork, vice president, Peoples Gas Light & Coke Co., Chicago, has been appointed chairman of a committee to explore the necessity of revising the constitution and by-laws of American Gas Association. Hugh H. Cuthrell, vice president, Brooklyn Union Gas Co., and president of A. G. A., announced last week. Other members of the committee appointed by Cuthrell are: John C. Flanagan, vice president and general manager, United Gas Corp., Houston; A. J. Gonnoud, president and general manager, Kings County Lighting Co., Brooklyn; Robert A. Hornby, vice president, Pacific Lighting Corp.; and W. G. Rogers, vice president, East Ohio Gas Co., Cleveland.

Michigan-Wisconsin Tariff Proposal Rejected by FPC

A proposed natural-gas tariff, filed by Michigan-Wisconsin Pipe Line Co. before Federal Power Commission, has been rejected by the commission.

The tariff would cover service through the firm's recently completed Texas-Michigan pipe line. A hearing was ordered for February 23.

Rehearing Denied by FPC On Panhandle Eastern Case

Federal Power Commission has denied four requests for rehearing of its interim order issued December 9 setting up emergency service rules governing deliveries of natural gas by Panhandle Eastern Pipe Line Co. during the current heating season.

The rules, which will remain in force until May 1, provide for curtailment of service when demands of customers exceed the capacity of the Panhandle system.

Applications for rehearing and stay of the December 9 order were filed by Ohio Fuel Gas Co. and by Public Utilities Commission of Ohio. East Ohio Gas Co. filed an application for rehearing, and Illinois Power Co. filed a petition for recision and vacation of the order or for rehearing.

The major contentions made in the applications and petition were that FPC lacks authority under the Natural Gas Act to adopt and prescribe the service rules; the commission erred in considering the increased volumes of gas which have become available to Ohio Fuel and East Ohio from sources other than Panhandle in ordering curtailment of large industrial loads served by those two companies; and the adoption of a curtailment plan with respect to large industrial loads constitutes an invasion of the authority reserved to local bodies.

FPC said that the Natural Gas Act does provide an adequate legal basis for the order, and cited several cases in which the courts have sustained such authority.

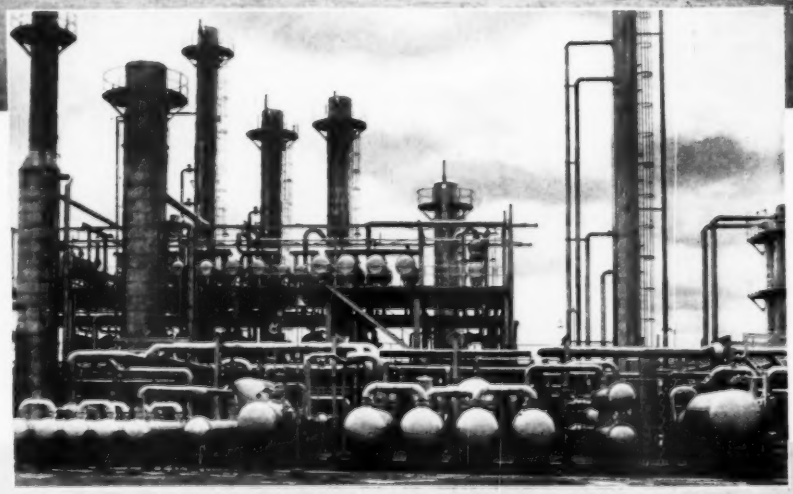
Hearing Set February 13 on Gas Service to the South

Federal Power Commission announced this week that hearing on three applications proposing construction of pipe-line facilities to carry natural gas to markets in the South, will reconvene February 13 in Washington, D. C. The hearing was previously continued indefinitely *(The Oil and Gas Journal, February 2, 1950, page 124)*.

The announcement said that FPC considered the matter of motions for dismissal filed by National Coal Association and associated parties and that the proceeding had been referred back to the presiding examiner for further hearing.

Proceeding involves applications filed by Atlantic Gulf Gas Co., United Gas Pipe Line Co., and Southern Natural Gas Co.

More than 100



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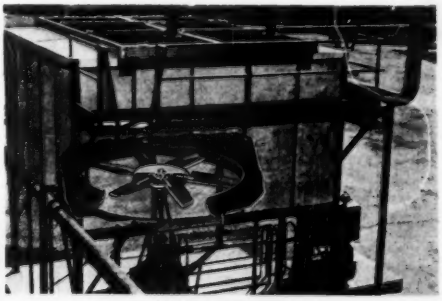

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REFINING

General Petroleum Corp. Sets Record at Torrance

A new record for crude runs at General Petroleum Corp.'s Torrance, Calif., refinery, was set during 1949, with a total of 37,475,000 bbl. This represents an increase of 4,300,000 bbl. over the 1948 total runs.

Average crude runs per day during December were 109,500 bbl., according to a company report.

The reformer at the refinery was shut down in December for furnace cleanout, and a Thermofor catalytic cracking unit was shut down for elevator chain repairs. In addition, the rerun unit was shut down for tie-in of the new doctor solution regeneration facilities, and was put back into operation December 10.

Frontier Refining Planning Terminal at North Platte

Frontier Refining Co. has announced that it has recommended construction of a storage terminal at North Platte, Neb., and a transport shuttle service to supply it. Studies are continuing on a proposed pipe line from Cheyenne, Wyo., to Lincoln, Neb., with terminals at Sidney, North Platte, and Grand Island.

Pending completion of the studies, Frontier plans to build the North Platte terminal, which will be put into use as soon as it is finished. It will then be available also as a pipeline terminal when the latter is completed.

Pacific Pipeline & Engineers, Ltd., is preparing plans for the terminal and invitations to bid on construction will be extended to at least three companies, Frontier reported.

Storage facilities will handle three grades of gasoline, kerosine, tractor fuel, distillate, fuel oil, and burner oil.

New Safety Record Set at Plains Butadiene Plant

Ceremonies held recently at the Plains butadiene plant, near Borger, Tex., marked the dedication of a new safety record for all Phillips Petroleum Co. installations—3,000,000 consecutive man-hours worked without time lost due to injuries.

This safety record, completed on January 27, covered a period of 23 months beginning on February 26, 1948. The first 1,000,000 hours were completed on October 6, 1948, and the second on May 22, 1949. The Plains plant, operated by Phillips Chemical Co., a wholly owned subsidiary of Phillips Petroleum, was also the first plant in the Phillips organization to reach the 2,000,000-hour mark.

A.S.L.E. Convention to Be Held in Detroit April 10

The fifth annual convention of the American Society of Lubrication Engineers will be held at Hotel Statler in Detroit April 10-12. The third annual lubrication exhibit of the society will be held in the hotel simultaneously.

"Preventive Maintenance Through Proper Lubrication" will be the keynote of the convention.

Among the 21 speakers who will address the 10 sessions of the convention are Dr. W. E. Campbell, Bell Telephone Laboratories, who will speak on "Lubrication of Electrical Contacts," and Dr. E. M. Kipp, Aluminum Co. of America, who will discuss "Multi-Purpose Lubricants."

Esso Standard Dedicates New Mechanical Building

BATON ROUGE.—Open house was held last week to mark the dedication of the new $3,000,000 central mechanical building at Esso Standard Oil Co.'s refinery here.

Among the thousands of visitors was Stanley C. Hope, president of Esso Standard, New York. Cecil Morgan, Esso vice president, is in charge of the Baton Rouge plant.

Covering an area of approximately 3¼ acres, the building provides the necessary additional mechanical facilities to maintain the expanded refinery operating equipment.

Aviation Gasoline Output Up in 11-Month Period

Aviation gasoline production during the first 11 months of 1949 totaled 42,867,000 bbl., an increase of 994,000 bbl., or 2.4 per cent, over the same period a year ago, a U. S. Bureau of Mines report reveals.

Demand for the fuel totaled 39,726,000 during that period, an increase of 1,754,000 bbl., or 4.6 per cent over the corresponding 1948 period.

Export demand rose 2,753,000 bbl., or 48.1 per cent from the same period

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in 1948, to 8,474,000 bbl. Domestic demand of 31,252,000 bbl. was down 999,000 bbl., or 3.1 per cent.

Demands for the fuel in November totaled 3,374,000 bbl., compared with 3,135,000 bbl. during the preceding month, and 3,618,000 bbl. in the same month a year ago.

Stocks on hand on November 30, 1949, totaled 6,822,000 bbl., an increase of 25,000 bbl. over the figure the same period a year ago.

Socony Aids Analysis

Studies in instrumental analysis at Lehigh University, Bethlehem, Pa., for the year beginning February 1 will be supported by Socony-Vacuum Oil Co., Inc., with a $2,000 fellowship announced last week. This latest award brings the company's total current fellowship support to nearly $40,000, covering nearly 20 fellowships at colleges and universities throughout the country.

Shell's Martinez Refinery Receives Safety Award

Employes of Shell Oil Co.'s Martinez, Calif., refinery have received a fourth Award of Honor for distinguished service to safety, by the National Safety Council for an outstanding 1948 safety record.

Robert Pike, safety council western representative, said that more stringent safety qualifications set by the President's Industrial Conference make the award even more noteworthy this year. The refinery in 1944 was the first ever to receive a safety award, and is now the first in refinery history to receive a fourth.

Between May and November of 1948 approximately 1,250,000 accident-free man-hours were maintained.

Oil-Shale Patents Listed By U. S. Bureau of Mines

Patents, both domestic and foreign, covering processes on the mining, retorting, and handling of oil shale, have been compiled in the new U. S. Bureau of Mines bulletin now available from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C.

Entitled "An Index of Oil-Shale Patents," the bulletin lists more than 800 American patents on oil shale available in United States Patent Office on January 1, 1945, and includes other English-language patents, as well as European-language patents.

Copies of the publication, Bulletin 468, compiled by Simon Klosky, bureau chemist, sell for $1.50 each and are available only through the Superintendent of Documents.

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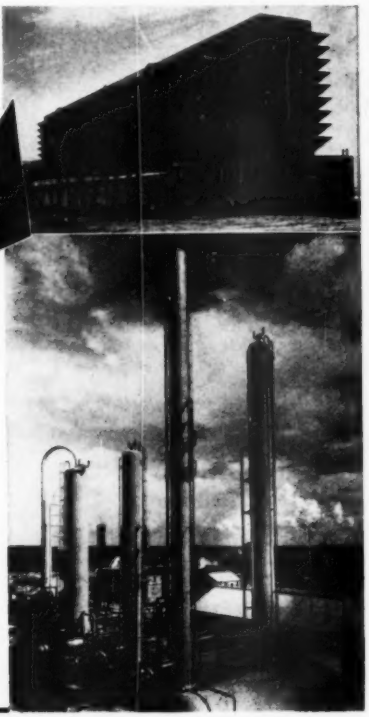

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Among the

Drilling Contractors

Two Deep Tests Started By Delta in East Texas

Delta Drilling Co., Tyler, Tex., is starting two additional deep wildcat tests in eastern Texas. One is for Lone Star Producing Co. at 1 Boyd, Jr., in the J. T. Falkenbury Survey, 5½ miles southwest of Fairfield, in Freestone County. It is projected to the Travis Peak, expected around 9,000 ft. The other is for Magnolia Petroleum Co. at 1 Payne, in the Ollen Odom Survey, 7 miles northeast of Coke, Hopkins County. It is projected to 8,900 ft.

Decem Drilling Co., Oklahoma City, is the contractor for Erle P. Halliburton Co. on a deep test extension test being drilled south of the Southeast Erin Springs pool, Garvin County, Oklahoma. The test, 1 Lester, in 36-4n-4w, was drilling below 7,700 ft. at latest report.

Regent Drilling Co., Edmonton, is moving a rig into the Stettler area, in central Alberta Province, where it will drill a Cretaceous test for Great West Exploration, Ltd., and Laguerre Gold Mines, Ltd. Regent also holds an operating interest in the project. The location, in LSD 3, 23-38n-21w4, is about a half-mile northeast of a recently completed wildcat Lower Cretaceous gas well.

Arrow Drilling Co., Dallas, has a rig working for The Texas Co. at 1 McGarrough, a newly started wildcat test in Section 151, Block 13, T&NO Survey, Ochiltree County, Texas Panhandle.

Brown Drilling Co., Long Beach, has contracted to drill a Miocene-Eocene test for Independent Exploration Co. at 1 Bennett-Smith, 31-18s-23e, in the Hanford area, Kings County, California.

Sam L. Tennant Drilling Co., Blackwell, Okla., has a rig running for Russell Maquire at 1 Hutchinson, a wildcat located in 20-27n-2e, 3 miles west of Kildare, Kay County, Oklahoma.

Newton Drilling Co., Coalinga, is starting a wildcat test in the Pyramid Hills area, Kings County, California, for Pacific Oil & Gas Development Co. It is 76-28 Sharpe, in 28-24s-18e.

ROTARY RIGS IN OPERATION*
(United States and Western Canada)

Area—	Week ended 1-30-50	Change week ended 1-23-50	Change week ended 1-31-49
Gulf Coast	496	— 6	— 96
W. Tex.-N. M.	688	—19	+239
Ark.-N. La.-E. Tex.	136	— 5	— 30
Oklahoma	229	+ 3	+ 18
Kansas	101	— 5	— 2
Illinois-Eastern	61	+ 2	0
Rocky Mountains	66	— 4	— 44
Pacific Coast	132	— 4	— 59
Total U. S.	1,909	—38	+ 29
Western Canada	59	—13	— 2
Total	1,968	—51	+ 27

*Courtesy Hughes Tool Co.

Crew of PLD Well Service Co., well-servicing and drilling contracting firm, Houston, now working in the Pierce Junction field, just south of Houston, in Harris County, Texas Gulf Coast. Left to right: R. W. Langston, toolpusher; H. G. Padon, driller; P. J. Bettin, floorman; R. M. Jackson, derrickman; R. S. Bort, floorman.

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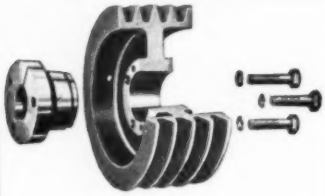

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History.—Now one of the industry's largest drilling contracting organizations, the present Parker Drilling Co. had its inception in 1934. It was formed by G. C. Parker, its present principal owner, who previously had been associated with the former Campbell & Parker Drilling Co. Starting with two rotary rigs, acquired from the latter company, and four cable-tool rigs, it has expanded its operations until it now maintains more than 50 rigs, 44 of which currently are running. In 1943 it bought out the George Barham Drilling Co. at Monahans, Tex.

G. C. PARKER

Activity.—The company has helped to develop nearly every major oil field of the past 15 years.

Currently, its rigs are scattered throughout most of the oil-producing areas in the United States and Canada, including the Rocky Mountain region of the United States and Canada, New Mexico, Oklahoma, Texas, Louisiana, Mississippi, and Florida. Ten rigs are located in western Canada. In addition, it has production of its own in several states.

Personnel. — As principal owner, G. C. Parker is president; R. A. Koons, vice president; R. N. Bynum, assistant secretary; H. B. Lynn, drilling superintendent; R. L. Parker and L. B. Clark, representatives in Tulsa; G. C. Colwell, Fort Worth representative; B. D. Baker, Houston representative; C. A. Nabors, Calgary, Alta., Canada, representative; Roy Fox, Texas superintendent; C. W. Swank, southern superintendent; Oadus White, Rocky Mountain superintendent; E. E. Klingsmith, Oklahoma superintendent; Paul Taylor, Canadian superintendent.

Toolpushers are: Texas, Roy Applewhite, W. D. Southern, W. J. Williams, N. L. Fuson, A. E. Shirley, J. L. Blair, A. L. Renick, F. W. Firebaugh, and N. Gilliam; New Mexico, J. L. Jones, H. Hilton, and William New; Mississippi, W. D. Blair and H. W. Kirkpatrick; Louisiana, A. C. Ledet; Florida, Fred Houck; Oklahoma, Harold Hickman, D. B. Ramdohr, J. P. Wagnon, George Meissner, and F. W. Howard; Canada, E. M. Bradley, C. T. Blackwell, L. H. Komarek, and Glen Koonce.

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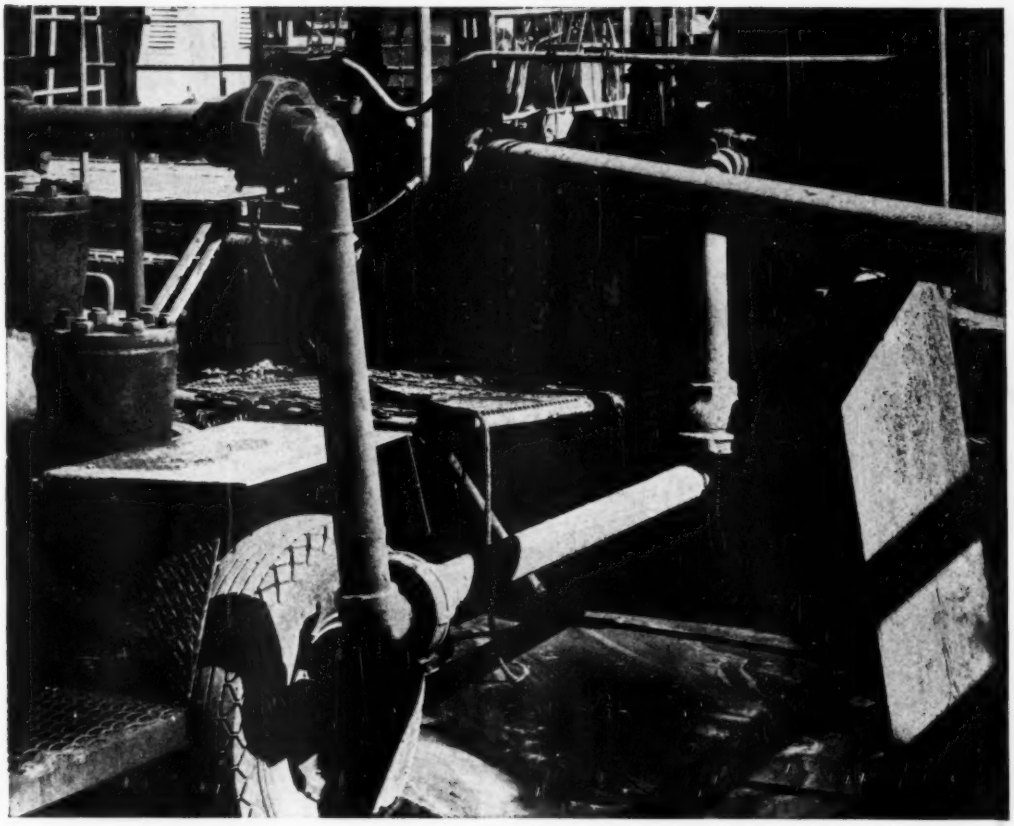

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Exploration and Drilling

Reefs Can Do Peculiar Things

THOSE geologists interested in reef accumulations of oil (there are probably about 7,000 such geologists) will no doubt be watching developments in the famous Golden Spike field in Alberta, Canada. It may well become a classic example of vagaries of rich oil accumulations in reefs.

Last April, Imperial Oil, Ltd., completed the discovery well, with a potential rating of 10,000 bbl. per day, from nearly 550 ft. of pay section. From the very start, Golden Spike was unusual. Location was reported to have been made on basis of seismic surveys, and the report was probably true. But even then it was less than 5 miles west of the nearest part of Woodbend portion of Leduc-Woodbend field. The water level in Woodbend was known. It was not too unreasonable to figure that if the Golden Spike wildcat found oil, the water level would not be too different from that at Woodbend; not in that short distance.

The Golden Spike wildcat did find oil, lots of it. But it found pay section for several hundred feet below the Woodbend water level, and in fact never did find any true water level. After drilling more than 500 ft. of good pay, it gradually found tighter and more dense lime with comparatively little fluid content of any kind.

Immediately after the discovery, Imperial stepped far out with two outpost tests, following its usual practice, so as to have data on which to make its acreage selection. It went 2½ miles north and 1¾ miles east for No. 2 Golden Spike, and simultaneously 2½ miles north and 2½ miles west for No. 3 Golden Spike. Both tests were dry.

After a pause, Imperial then backed up and started a gradual stepout from the discovery, feeling its way. By this time more than a few geologists were talking about the discovery being on a lone pinnacle sticking far up from the normal reef level. No. 4 well was located ½ mile north and ¾ mile east of the discovery. Recently it came in for a good well, picking up the top of the Devonian D-3 1 ft. higher than the discovery, and a pay section rated at about 546 ft. thick.

No. 5 came in shortly thereafter and is just about completed. It is located ½ mile north and ¼ mile east of the discovery. This puts it just ½ mile west of No. 4. But No. 5 had some surprises of its own. In the first place, on drill-stem test, it indicated it would make an oil well in the D-2 zone, which had not shown for production in any of the other tests. Then it picked up the top of the D-3 zone about 5 ft. low to the discovery and 6 ft. low to No. 4 Golden Spike ½ mile east.

Imperial is drilling on No. 6 now at a location ½ mile south and ¼ mile west of the discovery. This will make it the farthest south well to date. Meantime, Okalta Oils, Ltd., which had some acreage in the area, is drilling on a location 3½ miles north and ¾ mile west of the discovery. The Okalta test is 1 mile north and 1½ miles east of Imperial No. 3, which was dry. The Okalta is also 1 mile north and 2½ miles west of Imperial's other dry hole, No. 2.

That is the stage now. If Okalta's well should come in a producer, it will open up a lot of territory in pretty much a north-south line from the discovery and two follow-up producers. If the Okalta well should miss the reef pay, cautious stepouts will continue to be order of the day.

Meantime, if Golden Spike is just a reef pinnacle, it is a sizable pinnacle, at a minimum ¾ mile long east and west, and at least ½ mile north and south. If Imperial No. 6 makes a producer, change the north-south distance to 1 mile. Within that area, the three producers have had a variation of only 6 ft. on top of the D-3 zone, certainly not much for reefs. But—the lowest of the three wells on the D-3 is the only one of the three to get oil in the shallower D-2 pay.

Where is the water level, if any, at Golden Spike? What happened in the few miles between Woodbend and Golden Spike to cause such a terrific change in reef characteristics? Can a small or even medium-sized pinnacle, if such it be, contain an extremely large accumulation of oil, stacked up in layer-cake fashion, instead of being spread out over a large area like Leduc and Redwater? If Golden Spike is rich, does this mean that small reef highs, very close to the edge of a proven field, are not necessarily too close to be another oil field? In how many places is that likely to happen? If it is rich, where did all that oil come from? What was the extent of the accumulation area?

Charles J. Deegan

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

MISSISSIPPI.—First Travis Peak production in the state has been established in the Pickens area of Yazoo County, by Carter Oil Co. 1 J. L. Wilson, 30-12n-3e, which flowed at the rate of 450 bbl. of 41°-gravity oil per day.

ROCKY MOUNTAIN AREA.—Oil was found in the first Dakota at Ohio's 1 Gurschke, 3-mile northwest extension in the Huntsman area, Cheyenne County, Nebraska. Delhi Oil Corp. recovered oil from the Sussex sand at its second North Meadow Creek well, Wyoming.

WEST TEXAS.—Five-eighths of a mile southwest of its Devonian discovery in Landon field of Cochran County, Stanolind Oil & Gas Co. 3 Birtie Brown, 14-L-PSL, was assured Pennsylvanian Bend production to add the fifth pay to the area. General American Oil Co. 1 Josie Peck, Midland County wildcat, entered the Ellenburger at 13,137 ft., minus 10,234 ft., and 594 ft. low to the Pegasus discovery, but had flowing oil from that formation.

NORTH TEXAS.—The first Viola lime production, and new discovery, for Wise County was indicated at Cities Service 1 Williamson, Block 4, Falls CSL, 5 miles northwest of Alvord. Top of the Viola was 6,971 ft., with first saturation at 7,004-36 ft., where a drill-stem test had oil in 25 minutes, and flowed for 35 minutes at the rate of 5 bbl. an hour.

N. CENTRAL TEXAS

Continental et al Sets Casing On Prospective Oil Producer

WICHITA FALLS.—Continental Oil Co. and Sinclair Oil & Gas Co. set casing around 5,972 ft. at the 1 Alliance Trust Co., Clay County discovery in Block 27, Orange County School Lands Survey, 2½ miles south of Henrietta. Top of the Caddo was 5,886 ft., and conglomerate with shows of oil was drilled from 5,972-79 ft. A 4½-hour drill-stem test of that interval showed gas in 8 minutes and produced a total of 73 bbl. of oil in approximately 3 hours and 40 minutes. Flowing pressure was not reported. Bottom-hole pressure was 2,400 psi.

The well was cored from 5,979-6,000 ft., to recover 18 ft. of saturated conglomerate. A drill-stem test of that section had gas in 6 minutes, oil in 8 minutes, which yielded 14 bbl. of oil the first 52 minutes of flow. From another source, apparently on the same test, oil flowed in 43 minutes, and at the end of a 4-hour and 43-minute period had made 68 bbl. of oil.

A new exploration for Clay County was announced by L. T. Burns as his 1 J. E. Lutz, 3 miles southeast of Bluegrove, and 7,000 ft. from north, and 3,700 ft. from east lines, T. F. Bates Survey. Contract depth was 6,500 ft. Location is 1½ miles north of Lyles Caddo field, but separated from it by a 6,100-ft. dry hole.

Medders & Huff 1 Fowler, Block 25, T. J. Belcher Survey, wildcat test 3 miles northwest of Bluegrove, and 3 miles northeast Acme field, drilled Strawn sand showing oil from 4,300-08 ft. A 2-hour test of the section recovered 125 ft. of heavily oil-cut mud and 880 ft. of salt water. Drilling continued below 4,650 ft.

Montague County.—The Texas Co. 1 Anna McFall, wildcat 8 miles southwest of Bowie, in the J. B. Robertson Survey, A-1548, was drilling below 6,760 ft. following a 1-hour drill-stem test from 6,736-60 ft. Recovery was 90 ft. of gas in the pipe and 30 ft. of slightly gas-cut mud. Bottom-hole pressure was 150 psi. in 20 minutes.

Continental Oil Co. 1 G. L. Nored, Section 27, ETRR Survey, A-240, 4 miles south of Montague, in the Kennedy Caddo area, acidized with 5,000 gal. in pay at 6,151-6,231 ft. and completed for 222 bbl. of oil in 6 hours, flowing through ½-in. choke. Gravity of the oil was 41° and gas-oil ratio was 433 cu. ft. Flowing tubing pressure was 175 psi.

Jack County.—Six miles southeast of Jacksboro, William Hamm, Jr., and others 1 E. F. Robertson, M. J. Swan Survey, A-1650, topped the Mississippian at 5,335 ft. and the Ellenburger at 5,393 ft., on elevation of 1,171 ft. A drill-stem test of the Ellenburger from 5,390-5,405 ft., through 9/16-in. bottom chokes, had gas in 1 minute, and recovered 160 ft. of high-gravity oil plus 20 ft. of muddy oil, with no water, in 2 hours. Two Bend conglomerate sands between 4,500 and 4,800 ft. had approximately 7,000,000 cu. ft. of gas a day. Operators prepared to run casing.

Warren Oil Corp. 1 Cable-Smith, wildcat in Lot H, M. Putnam Survey,, A-465, 2 miles southwest of Shannon field and 2 miles southwest of Shannon, recovered 4 gal. of gas-cut mud on a 2-hour drill-stem test at 6,134-48 ft. Lime with odor was drilled from 6,212-16 ft., and a 2-hour drill-stem test recovered 35 ft. of slightly gas-cut mud. It was drilling ahead at last report.

NORTH CENTRAL TEXAS (DISTRICTS 9 AND 7-B) SUCCESSFUL WILDCATS

Archer County: Needl & Hood Drilling Co. 3 J. H. White, Lot 6, Blk. 42, ATNC Subd., 5 mi. NE Geraldine, TD 1,572 ft., pay 1,562 ft., pumped 8 bbl. of 41° gravity oil a day.

Jack County: Daniel Oil Co., Inc., 1 O. C. Brown, W. Brummett Sur., 12 mi. SE Jacksboro, TD 4,565 ft., pay 4,555 ft., 7,500,000 cu. ft. gas a day.

New field—L. M. Lockhart and C. C. Glasscock 1 L. A. Worthington, SPRR Sur., A-575, 5 mi. N Jacksboro, TD 5,410 ft., perf. conglomerate 5,383-88 ft., fliwed 176 bbl. of 39.5°-gravity oil a day, ¼-in. choke, GOR 1,050 cu. ft., CP 1,485 psi., TD 875 psi.

Russell Maguire 1 Ruth Richards, B. F. Terry Sur., A-611, 5 mi. N Perrin, TD 5,379 ft., perf. 4,558-60 ft., 4,300,000 cu. ft. gas daily, shut-in pressure 1,200 psi.

Mid-Continent Petroleum Corp. 2 G. W. Fowler "A," C. H. Simpson Sur., A-1654 (933 ft. N 1-A Fowler, oil discovery) 4 mi. SW Cundiff, TD 6,494 ft., set 7-in. casing 6,352 ft., perf. 5,488-5,506 ft., 2,500,000 cu. ft. gas a day, shut in.

Jones County: New field—S. B. Roberts 1 Bert Fields, Samuel Andrews Sur. 191, 3½ mi. E Hawley, TD 2,161 ft., elev. 1,671 ft., top pay 2,156 ft., set casing 2,159 ft., pumped 45 bbl. of 43°-gravity oil a day, 50 per cent water, GOR 800 cu. ft.

Young County: New field—Mitchell Oil Co. 1 Thompson, Sec. 1,446, TE&L Sur., A-872, 2 mi. NW Jean, TD 1,008 ft., oil sand 726-732 ft., pumped 8 bbl. oil a day.

NORTH CENTRAL TEXAS (DISTRICTS 9 AND 7-B) WILDCAT FAILURES

Archer County: R. A. King & Sons 1 J. J. Perkins, 2-71-SPRR, A-856, 3 mi. NW Holliday, dry, TD 1,336 ft., sand with oil show 1,598-1,602 ft.

Cooke County: Sun Oil Co. 1 Wm. Fleitman, James Rose Sur., A-843, 3 mi. W Gainesville, dry, TD 2,275 ft.

Coleman County: Pioneer Oil & Gas Co. 1 H. H. Harriss, J. W. Foster Sur. 73, SE corner of county, dry, TD 881 ft., elev. 1,460 ft., Caddo 852 ft.

Richland-Texas Co. 1 C. G. Hudgins, GH&H Sur. 154, A-1258, 12 mi. S Coleman, dry, TD 2,518 ft., elev. 1,646 ft.

Viking Oil Corp. 1 Earl Ellis, Pleasant Young Sur. 494, 6½ mi. SE Santa Anna, dry, TD 2,300 ft., elev. 1,519 ft., Fry sand 1,326 ft., base Caddo 1,958 ft., top Ranger 2,048 ft., no shows.

Carrel Walker 1 B. W. Yarbrough, Hugh Frazier Sur. 244, 16 mi. S Santa Anna, dry, TD 1,615 ft., sand with water 1,140-60 ft.

Eastland County: L. R. Pearson 1 W. A. Shaban, 36-4-H&TC, 7 mi. NW Eastland, dry, TD 1,855 ft. elev. 1,502 ft., sand 1,848-55 ft.

Jack County: Jack Grace Production Co. 2 L. L. Campsey, J. J. Ward Sur. A-1727, 9 mi. N Jacksboro, dry, TD 5,488 ft.

Russell Maguire 1 A. W. Shawver, Arnold & Barrett Sur., A-1025, 6 mi. N Perrin, dry, TD 4,805 ft., sand with oil odor 3,780-98 ft.

Montague County: Continental Oil Co. 1 E. L. Edgin, Isaac Garner Sur., A-1287, 3 mi. S Bowie, dry, TD 7,421 ft., perf. conglomerate 6,004-16 ft.

R. C. Lipscomb 1 R. R. Breeze, A. J. Miller Sur., A-491, 5 mi. N Nocona, dry, TD 5,272 ft.

Nolan County: Robert S. Lytle 1 Mrs. Faye Sanders, 9-Z-R&P, 8 mi. E Megargel, dry, TD 6,722 ft., elev. 2,52[illegible] ft., Valera 2,610 ft., Noodle 3,630 ft., reef 4,025 ft., Strawn 5,710 ft., Ellenburger 6,660 ft.

Palo Pinto County: Joe W. Miller 1 J. F. Rogers, Sec. 889, TE&L Sur., 3 mi. W Oran, dry, TD 1,500 ft., elev. 915 ft., lime 1,450 ft., coal 1,220 ft., sand 1,350 ft.

Stephens County: Rose & LeBus Drilling Co. 1 A. M. Moon, Blk. 1,052, TE&L Sur., 1 mi. SE Ivan, dry, TD 3,996 ft., elev. 1,193 ft., Caddo 3,286 ft.

Taylor County: Hickok & Reynolds, Inc., 1 J. Armstrong, Sec. 3, Burr & Caswell Sur., 8 mi. SW Merkel, dry, TD 5,424 ft., elev. 2,072 ft., Palo Pinto 4,190 ft., reef 3,725-5,045 ft., Caddo 5,300 ft., oil show 4,633-15 ft.

Wilbarger County: W. T. Waggoner est. 1 Waggoner "YY," 21-6-H&TC, 14 mi. SW Electra, dry, TD 4,952 ft., elev. 1,135 ft.

Young County: Chas. E. Morrison and E. W. Whitaker 1 C. W. Whitaker, Sec. 1585, TE&L Sur., A-928, 1½ mi. N Springcreek, dry, TD 1,596 ft.

M. R. Stipe 2 W. S. Cole, TE&L Sur., 1456, 5 mi. E Olney, dry, TD 725 ft. in shale.

SOUTHWEST TEXAS

New Field Tapped Within City Limits

CORPUS CHRISTI.—In Block 8 of the city of Corpus Christi Lake, Jim Wells County, Daubert, Achning & Quin completed the 1 Mrs. Lou Ella Wade as an oil discovery. On potential, the well flowed 133 bbl. of 39°-gravity oil per day through a ⅛-in. choke. Hole is bottomed at 5,026 ft., and is producing through perforations at 5,022-24 ft.

Also in Jim Wells County, William Hamm, Jr. has run potential on the 1 Myra L. Duboise, gas discovery in the J. G. de la Garza Montemayor "Casa Blanca" Grant, Abstract 296. The well flowed 5,100,000 cu. ft. of gas per day on open flow through perforations at 4,004-14 ft. Shut-in tubing pressure was 1,650 psi. and shut-in pressure on the casing was 1,700 psi. The hole was drilled to 5,625 ft. and 5½-in. casing set at 4,095 ft.

James G. McCarrick, Trustee, completed the 1 George W. Fraser Unit for a southeast extension to the Chicago Corp. 1 H. E. Butt Grocery Co.'s oil discovery in Nueces County. The well flowed 150 bbl. of 42°-gravity oil per day through a ⅛-in. choke with 1,375 psi. pressure on the tubing. Hole is bottomed at 6,955 ft. and production is through perforations at 6,914-17 ft. The well is located in Block 19 of the J. C. Russell Farm Blocks, ½ mile west of Corpus Christi.

A new pay has been opened in West Sinton shallow field of San Patricio County, with completion of J. M. O'Melveny Production Co. 4 Montgomery. Through perforations at 2,353-60 ft., the well flowed 215 bbl. of 21.5°-gravity oil daily through a 3 16-in. choke. Tubing pressure was 220 psi. and the casing was sealed. Total depth of the hole is 3,496 ft. with pay topped at 2,353 ft. and 5½-in. production casing set on bottom.

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) SUCCESSFUL WILDCATS

Jim Wells County: New pool—Daubert, Achning & Quin 1 Wade, Casa Blanca Grant, A-296, TD 5,026 ft., 133 bbl. of oil from 5,022-24 ft., ⅛-in. choke, TP 655 psi., CP 900 psi., 39° gravity.

Gas discovery, "Duboise"—William Hamm, Jr., 1 Duboise, J. G. de la Garza Montemayor "Casa Blanca" Grant, A-296, TD 5,625 ft., perf. 4,004-14 ft., IP: 5,100,000 cu. ft. gas from 4,004-14 ft.

Nueces County: New pay, London Gin—Barnsdall Oil Co. 4 C. N. Cooke, Block 1, Jones Subd., Gallagher Ranch, TD 5,775 ft., 4,400,000 cu. ft. gas, open flow from 4,834-37 ft., SIP 1,786 psi.

San Patricio County: New pay, West Sinton shallow—J. M. O'Melveny Production Co. 4 Montgomery, Lot 24, John Pilan Subd., TD 3,496 ft., 215 bbl. oil per day from 2,353-60 ft.

SOUTHWEST TEXAS (DISTRICTS 1 AND 4) WILDCAT FAILURES

Caldwell County: R. L. Delp and H. D. Rouse 1 William A. Germer, William House ⅛ League Grant, 2½ mi. W Lockhart, dry, TD 1,721.

Guadalupe County: Mills, Blackmon et al 1 Frido Gutz, Claiborne Rector League, 1 mi. W Marion, dry, TD 810 ft.

Utah Oil Corp. 1 E. J. Zuehl, Vicente Duran Sur. 23, A-19, 12 mi. SW Seguin, dry, TD 1,699 ft.

Jim Hogg County: Rand Morgan 1 Joseph Gruy, Jr., et al, Noriecitas Grant, A-356, 1¼ mi. N Hebbronville, dry, TD 4,510 ft.

Orlee Oil Co. E-1 M. Guerra & Son, Las Cuevitas Grant, dry, TD 2,083 ft.

Kimble County: R. F. Schoolfield 1 Geo. F. Rust, BF&S Sur. 42, A-1759, 16 mi. NW Junction, dry, TD 2,610 ft.

McMullen County: Dan R. Foster 1 fee, Two Rivers Ranch Subd., Like Oak School Lands Sur., 5 mi. SW Tilden, dry, TD 1,600 ft.

Nueces County: H. J. Mosser 1 C. S. Bos-

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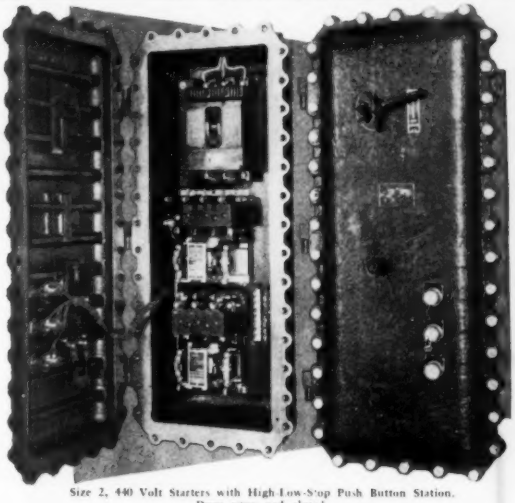

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well, F. Z. Bishop Subd., Palo Alto Grant, 3 mi. S Driscoll, dry, TD 7,650 ft.

San Patricio County: Danciger Oil & Refining Co. and Renwar Oil Corp. 1 Jean M. Davis, Peterson Subd., Lot 29, William Boyd Sur., 4 mi. W Aransas Pass, dry, TD 7,262 ft.

Hawn Bros. et al 1 Clifton Ranch, Concepcion Leal de Gomez Sur., A-340, 5 mi. SE Tynan, dry, TD 5,609 ft.

Fred M. Manning, Inc., 1-A C. S. Brown, E. J. McGloin Sur., 2½ mi. NW Mathis, dry, TD 4,778 ft.

Starr County: Bairidge & King, Inc., 2 T. B. Slick Est., El Panal Grant, 3 mi. S Barosa field, dry, TD 7,602 ft.

Morris Cannan 1 Downs Royalty Corp., El Javali Grant, Beer & Coffey Subd., dry, TD 2,430 ft.

Webb County: Rupert Cox and Dan L. Clark 1 Marshall Bros., Sur. 674, 10 mi. NW Bruni, dry, TD 2,519 ft.

Sid Katz and R. H. Venable 1 A. M. Bruni Est., Block 65, Brown Subd., Las Albercas Grant, dry, TD 2,173 ft.

ROCKY MOUNTAIN

Oil Tests Add Impetus To W. Nebraska Pay

DENVER—Oil was recovered in the first Dakota sand at Ohio Oil Co.'s 3-mile northwest extension in the Huntsman area, Cheyenne County, Nebraska, causing further excitement in the oil play that started in this part of the state last year. The well, 1 Gurschke, SW NE SE 3-14n-50w, topped the possible pay zone at 4,719 ft. A 1-hour and 19-minute test recovered 3,913 ft. of 35°-gravity oil. Some oil was found in this sand at the company's discovery well in this area, but the base of the horizon tested water. No water was recovered on the present test. The discovery well in this area was recently completed for 30,000,000 cu. ft. of gas daily from the third Dakota, and the operator is now drilling ahead at the 1 Gurschke for a test of that formation. Ohio found water, with some oil, on tests in the first Dakota at its 1 Mather, midway between the Huntsman discovery and the 1 Gurschke, and both wells are now nearing the third Dakota objective.

A total of 52 ft. of saturation was found by Delhi Oil Corp. at its ½-mile north extension to North Meadow Creek field, Johnson County, Wyoming. On a drill stem test in the top 14 ft. of sand, the well made 2,640 ft. of oil and 270 ft. of oil-cut mud. On a second test, between 4,022-66 ft., the recovery was 3,040 ft. of green oil and 330 ft. of oil-cut mud. The operator is coring ahead for the Shannon sand. At the pool opener, Delhi found Shannon oil but completed the well in the Sussex, a stray sand above the Shannon. Continental Oil Co.'s Meadow Creek wildcat, 2 miles south of Delhi's North Meadow Creek discovery, found oil in the Shannon and is now headed for the Lakota formation.

Water was recovered by Atlantic Refining Co. on tests in the first Leo sand at its 1 Joss, C NW NW 1-34n-66w, an extension 1 mile south of its Lightning Creek, Wyoming, discovery well. On a 1-hour test, between 5,250-69 ft., the well made 470 ft. of mud and fresh water.

WYOMING WILDCAT FAILURE

Natrona County, Boone Dome: Ohio Oil Co. 1 Govt., NW NE SE 9-35n-85w, TD 7,518 ft., Steele 165 ft., Sharkstooth 2,183 ft., Niobrara 3,440 ft., speckled shale 3,675 ft.

NORTHERN NEW MEXICO SUCCESSFUL WILDCAT

Rio Arriba County, Lindrith area: Delhi Oil Corp. 1 Ingwerson, C SE SE 20-24n-2w, TD 7,802 ft., pumped and flowed 140 bbl. of oil per day, perf. 7,671-77 ft. and 7,680-866 ft., pumped and flowed 115 bbl. of oil in 18 hours, Pictured Cliffs 3,095 ft., Lewis 3,145 ft., Mesa Verde 4,730 ft., Mancos 5,290 ft., Dakota 7,515 ft., second Dakota 7,623 ft., third Dakota 7,720 ft., Morrison 7,750 ft.

PERMIAN BASIN

Tex-Harvey Field Opener Confirmed by Good Well

MIDLAND.—Ted Weiner 1 L. B. Floyd, SW NW 15-37-T3S-T&P, Midland County, east offset to Tex-Harvey field discovery, completed for a pumping potential of 249 bbl. of oil a day, plus some water, from top of pay at 7,610 ft. Total depth was 8,012 ft., and elevation was 2,608 ft. Nitro shot was placed from 7,650-8,012 ft., and production was from open hole.

General American Oil Corp. 1 Hal C. Peck, 21-41-T4S-T&P, was drilling ahead at 13,020 ft. in lime, shale, and sand, just out of hard sand identified as the Simpson. Operators believed it would be in the Ellenburger within another 100 ft. The well is believed to lie on a different structure from Pegasus field, some 4 miles to the east.

York & Harper, Inc., 1-A TXL, 25-29-T3S-T&P, 13 miles south of Midland, perforated casing from 9,737-65 ft. and 9,820-60 ft., acidized with 2,000 gal. and swabbed from 3-4 bbl. of oil an hour. Operators were to reacidize. Total depth was 13,250 ft.

Upton County.—Republic Natural Gas Co. 1 American Republics Corp., 6-40-T5S-T&P, wildcat test 1 mile southwest of a south extension to Pegasus field, ran a 14-hour drill-stem test from 13,025-13,118 ft., in the Ellenburger. Gas showed in 40 minutes and recovery was 1,620 ft. of oil and gas-cut mud. Top on the Ellenburger was 13,025 ft. At last report it was to perforate from 12,370-440 ft. for a test of the Fusselman section.

Plymouth Oil Co. completed three dual producers in Benedum field this week, all in the same county. The 1-3 W. H. Dixon, Section 3, C. Bendle Survey 3, flowed 720 bbl. of distillate from perforations in the Ellenburger at 11,360-440 ft., total depth, and 446 bbl. of distillate from Fusselman perforations at 10,900-950 ft. Both 24-hour gages were through 20/64-in. chokes.

Plymouth 2-47 E. Gordon, 47-Y-TCRR, flowed 604 bbl. and 295 bbl. of distillate, from the Ellenburger at 11,375-434 ft., total depth, and Fusselman perforations at 10,820-880 ft. The flow from the Ellenburger section was without acid. Treatments of the latter zone, if any, were not disclosed.

Plymouth 2-48 J. S. Elliott, 48-Y-TCRR, flowed 194 bbl. of distillate through 27/64-in. choke from 180 Ellenburger perforations at 11,345-390 ft. after 1,000-gal acid treatment, and 506 bbl. of distillate through 30/64-in. choke from 240 Fusselman perforations at 10,970-11,030 ft., and 5,000 gal. of acid. Total depth was 11,440 ft.

WEST TEXAS (DISTRICTS 8 AND 7-C) SUCCESSFUL WILDCATS

Gaines County: Extension and new pay, Flanagan field—Magnolia Petroleum Co. 1 H. T. Wolfe, NE NE 7-A23-PSL, 1 mi. W production, TD 7,493 ft., PB 6,467 ft., elev. 3,328 ft., upper Clear Fork pay 6,460 ft., perf. 132 shots 6,422-55 ft., pumped 71.8 bbl. of 29.9°-gravity oil a day, GOR 154 cu. ft.

Runnels County: Extension and new pay—James E. Kemp 1 Mrs. M. J. Adams, 4,350 ft. from N, 330 ft. from E lines, Sec. 13, C. D. Skidmore Sur. 13 (2,500 ft. SW Rambo & Stevens 1 Murray, Strawn discovery) TD 4,590 ft., elev. 2,002 ft., Fry sand 4,371 ft., perf. 4,373-89 ft., flowed 588 bbl. of 41.9°-gravity oil a day, 23/64-in. choke, GOR 850 cu. ft., TP 90 psi., CP 250 psi.

WEST TEXAS (DISTRICTS 8 AND 7-C) WILDCAT FAILURES

Coke County: Southern Minerals Corp. and Bridwell Oil Co. 1 S. A. Runkles, 20-

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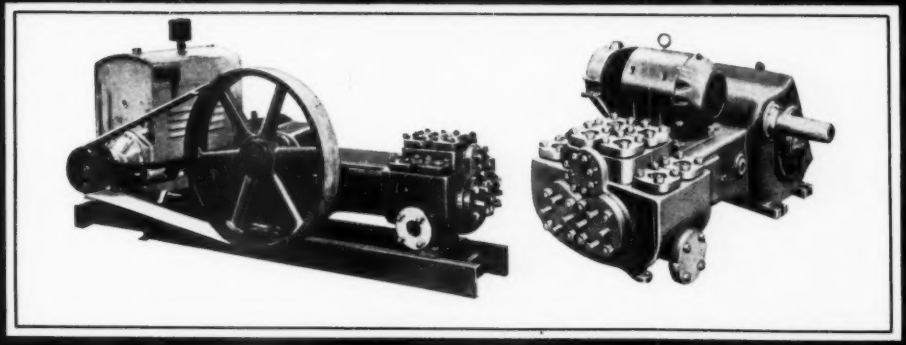

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W-T&P, 7½ mi. S Millican field, dry, TD 7,624 ft., elev. 2,530 ft.

Ector County: The Texas Co. 1 F. S. Springer, SW SE 22-B15-PSL, 3 mi. W Penwell Ellenburger field, dry, TD 10,010 ft., PB 7,760 ft., elev. 2,889 ft., Silurian 8,390 ft., Fusselman 8,582 ft., Montoya 8,791 ft., Simpson 8,982 ft., McKee 9,332 ft., Ellenburger 9,952 ft.

Garza County: Comanche Corp. 1 C. E. Morrow, Sec. 1,217, TTRR Sur., 3 mi. N Post, dry, TD 3,280 ft., elev. 2,637 ft., San Andres 2,452 ft.

Tom Green County: Bridwell Oil Co. et al 1 T. N. Robbins, Sec. 173, WCRR Sur., 1½ mi. NW San Angelo, dry, TD 6,501 ft., elev. 1,939 ft., Strawn 5,308 ft., Ellenburger 6,440 ft.

Hiawatha Oil & Gas Co. 2 W. G. Currie, 19-25-H&TC, E offset to Strawn discovery, dry, TD 5,321 ft., elev. 2,225 ft., reworked Ellenburger 5,250 ft.

Moore Exploration Co. 1 L. C. Clark, Sec. 5, GC&SF Sur., 5 mi. S Broome, 1 mi. NE Water Valley field, dry, TD 1,092 ft., elev. 2,200 ft.

SOUTHEAST NEW MEXICO

HOBBS.—Stanolind Oil & Gas Co. completed its 1 D. E. House, NE SE 11-20s-38e, as a ½-mile south extension to the discovery well, and as a new pay for House field. Total depth was 4,440 ft., plugged back to 4,347 ft. Top of the San Andres was 4,265 ft., elevation 3,579 ft., and top of pay 4,270 ft. Initial potential was 99 bbl. of 29 -gravity oil a day, through 16 64-in. choke, with gas-oil ratio of 1,326 cu. ft.

In Chaves County, 11 miles southeast of Elkins, Magnolia Petroleum Co. 1 Lightcap Land Co., SE SE 6-8s-30e, was drilling below 3,615 ft. Drill-stem tests at 3,141-3,215 ft. recovered 30 ft. of drilling mud with no shows, and at 3,585-3,612 ft. recovery was 2,790 ft. of sulfur water plus 90 ft. of drilling mud. The tool was open 1 hour on the first, and 75 minutes on the latter test. The well was scheduled to 9,500 ft., or the pre-Cambrian.

Honolulu Oil Corp. 1 State, 13-11s-27e, Chaves County wildcat, recovered 15 ft. of dolomite with some porosity, from 6,530-45 ft., and 6 ft. of the same from 6,545-50 ft. A 5-hour and 15-minute drill-stem test from 6,515-50 ft. had gas in 5 hours and recovered 780 ft. of oil, 600 ft. of mud-cut oil, plus 30 ft. of mud and water. Flowing pressure was 500 psi.

SOUTHEAST NEW MEXICO SUCCESSFUL WILDCATS

Lea County: New field, 12 miles SE Caprock field—Gulf Oil Corp. 1 Mrs. Maud Saunders, SE SW 34-14s-33e, TD 13,235 ft., PB 10,709 ft., elev. 4,207 ft., Pennsylvanian 9,586 ft., tentative Mississippian 12,930 ft., Pennsylvanian pay 9,865 ft., perf. 70 shots at 9,865-82 ft., flowed 984 bbl. of 42.7 -gravity oil, 456 bbl. salt water, GOR 1,503 cu. ft., TP 100 psi.

Bough field E extension or discovery: Magnolia Petroleum Co. 1 Walker-Federal, SW SW 8-9s-36e, TD 9,729, elev. 4,099 ft., Pennsylvanian pay 9,715 ft., flowed 501 bbl. of 47 -gravity oil a day, TP 75-550 psi., CP 450 psi., GOR 1,400 cu. ft.

SOUTHEAST NEW MEXICO WILDCAT FAILURES

Chaves County: Dekalb Agricultural Assn., Inc., 1 Compton, NE NW 26-11s-27e, dry, TD 2,126 ft., elev. 3,784 ft., Queen 1,037 ft., San Andres 1,425 ft.

Lea County: Richardson & Bass 1 Julia Brainard, NE SE 19-19s-34e, dry, TD 5,010 ft., elev. 3,703 ft., anhydrite 1,627 ft., base salt 3,195 ft., Yates 3,445 ft., Queen 4,760 ft.

TEXAS PANHANDLE (DISTRICT 10) SUCCESSFUL WILDCATS

Sherman County: Phillips Petroleum Co. 1 Willclo, 2,349 ft. from N, 2,530 ft. from W lines, 15-3T-T&NO, SE corner of county, TD 6,464 ft., PB 5,889 ft., elev. 3,392 ft., perf. 5,844-80 ft., pumped 225 bbl. of 39 -gravity oil a day from Pennsylvanian.

Stanolind Oil & Gas Co. 1 Lasley, 2,490 ft. from N and E lines, 126-1C-GH&H, TD 3,145 ft., elev. 3,503 ft., 15,491,000 cu. ft. of gas a day, perf. 2,992-3,036 ft., open hole 3,055-3,145 ft., RP 345 psi.

Stanolind Oil & Gas Co. 1 Ransdell, 2,490 ft. from N and E lines, 125-1C-GH&H, 8 mi. NE Coldwater, TD 3,130 ft., elev. 3,508 ft., 19,008,000 cu. ft. of gas a day, perf. 2,902-3,103 ft., open hole 3,111-30 ft., RP 362 psi.

TEXAS PANHANDLE (DISTRICT 10) WILDCAT FAILURES

Armstrong County: Cities Service Oil Co. 1 Swift, NW NW 108-B3-H&GN, 2 mi. NE Goodnight, dry, TD 3,620 ft., elev. 3,032 ft.

Ochiltree County: Gulf Oil Corp. 1 Harbaugh "C," NW NW 142-13-T&NO, 20 mi. S, 3 mi. W Perryton, dry, TD 11,200 ft., elev. 3,003 ft.

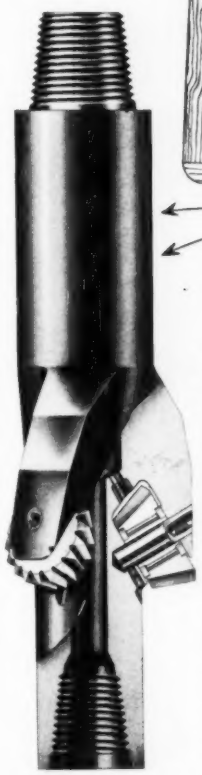
Gulf 1 Wamble, 3,321 ft. from S, 660 ft. from W lines, E½ J. J. Ballentine Sur., 20 mi. S, 8 mi. W Perryton, dry, TD 11,640 ft. in lime, elev. 3,074 ft.

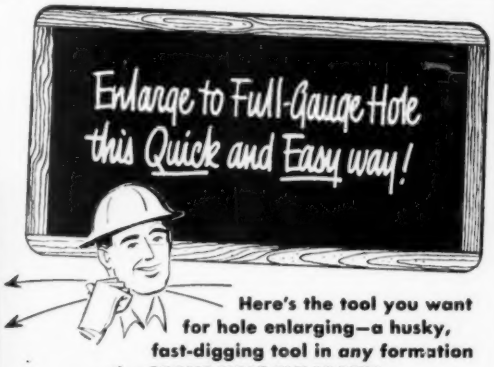
CANADIAN FIELDS

Two Devonian Fields Confirmed in Alberta

CALGARY.—Two Alberta discoveries of 1949 were rated as fields this week: Canadian Gulf Oil Co. completed its third well in Stettler pool which the company opened several months ago; Pacific Petroleums was assured success by drill-stem test at its third well for Excelsior pool discovered by Imperial Oil, Ltd., in December.

Gulf's success, in a Devonian pool 100 miles northeast of Calgary, rated a substantial initial potential from the D3 zone of 2,208 bbl. daily. The well, Gulf-C. P. R. 13 Ellis, is in LSD 13, 3-38-20w4, ¼ mile south of the field discovery. It found 100 ft. of oil-bearing D2 zone, cased that off,





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Reamers	Bulletin No. 43
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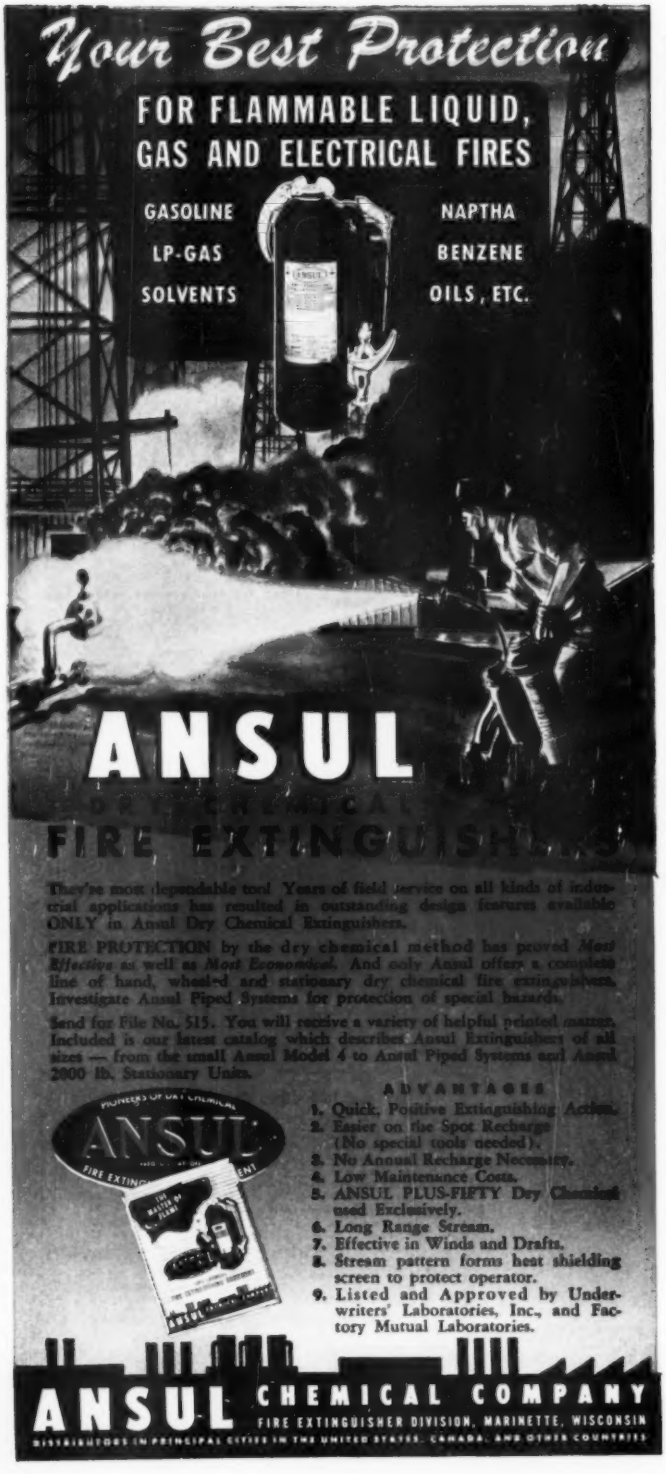
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and completed in the D3 with around 50 ft. of pay.

Pacific-Excelsior 1, LSD 13, 2-56-24w4, 1 mile east of Imperial's discovery, was classed as an important extension to the pool. At the bottom 3,878 ft., the well had opened 33 ft. of D2 Devonian pay zone and was continuing to core and test at 5-ft. intervals. It has shown oil on three separate drill-stem tests to date, with oil flowing during one, and large pipe recovery of clean crude, no water, on others. This is a joint operation of Pacific Petroleums, Sunray Oil Co., Atlantic Oil Co., Calvan Petroleums, and Tower Petroleums.

Eleven wells were completed in Alberta during the past week, to boost total completions to 43 for the first month of 1950. At Leduc, four oil wells and one extension test failure were completed. At Redwater, four wells were placed on production. An oil producer was brought in at Stettler, and a crossmont area test completed as dry.

CANADIAN WILDCAT FAILURE

Imperial-Grosmont 1, LSD 13, 17-67-23w4, TD 6,406 ft.

TEXAS GULF COAST

Old Clay Creek Field Gets Deep Production

HOUSTON—The Alaska Steamship et al 1 Ida Rosenbaum, Washington County wildcat, is making an estimated 8 bbl. of 42°-gravity oil per hour on a 10/64-in. choke, with 800 psi. pressure on the tubing and 825 psi. pressure on the casing. Hole is bottomed at 5,012 ft. and is flowing through perforations at 5,008-11 ft. Location of the new deep production on the southwest flank of Clay Creek Dome is in the Nestor Clay Survey, Abstract 29, 12 miles north of Brenham. The field was first discovered in 1928 with production ranging from 1,150-80 ft.

Morris Mizel and Rock Hill Oil Co. completed the 1 Erwin Landgrebe for a gas discovery ⅔ mile east of Brandt, Goliad County. The test flowed gas and distillate through perforations at 7,538-45 ft. with 5½-in. production casing set at 7,900 ft. The well, which has been shut in, is in the Thomas Hancock Survey, Abstract 142, 10 miles north of Weesatche field.

Also in Goliad County, Rock Hill Oil Co., Daugherty & Kidd, and Stanolind Oil & Gas Co. completed the 1 J. B. Wilhelm for another gas discovery. Operators set 5½-in. casing at 4,263 ft. and perforated from 3,219-24 ft. The well flowed gas and condensate, no gage, and was shut in. The new discovery is located in the Kilgore Survey, Abstract 172.

A strong show of gas is reported to have been logged in Texana Petroleum Co.'s 1 First National Bank of Orange, Orange County wildcat in the T. Strong Survey. The sand was reported at 9,054 ft. This test is approximately 7 miles northwest of Ohio Oil Co. 1 Brown, across the line into Calcasieu Parish, La., which flowed oil while testing at around 7,800 ft.

A new shallow sand in Racoon Bend pool, Austin County, is apparently being opened up by Humble Oil & Refining Co. 13 Austin College. The well flowed dry gas from 3,740-45 ft. and perforations were squeezed. Operators plugged back and perforated from 3,036-48 ft. and tubing is being set for completion.

TEXAS GULF COAST (DISTRICTS 2 AND 3) WILDCAT FAILURES

Bee County: Edwin B. Cox & Jake L. Hamon 1 Jamie Hynes, Timothy Hart Sur., A-28, 1⅝ mi. NW Refugio County line, 3 mi. NE Papalote, dry, TD 6,204 ft.

Brazoria County: John Neilson 1 David Reipe, Chester S. Corbett Sur., A-64, 5 mi. W Sandy Point, dry, TD 8,210 ft.

Karnes County: The Texas Co. 1 Mrs. Creacy Cure, James Fannie Sur., 4½ mi. SE Nixon, dry, TD 5,515 ft.

Lee County: Geochemical Exploration Co., Inc., 1 Emma Jester, W. H. Bynum

Sur., A-6, 5½ mi. E Lexington, dry, TD 1,962 ft.

Victoria County: Gaylord H. Chizum 1 Mrs. Rose L. Musselman, IRR Sur. 47, A-227, 4 mi. NE Welder Ranch field, 13 mi. NE Victoria, dry, TD 3,180 ft.

Wharton County: Finley Co. et al 1 Emily A. Wetherer, L. P. Ogden Sur., A-535, 9 mi. SW El Campo, dry, TD 5,175 ft.

LA.-ARK.

Claiborne Parish Prospect Flows Oil, Continues Tests

SHREVEPORT.—Ohio Oil Co. and Gulf Refining Co. 1 O. L. Martin, Claiborne Parish wildcat in 3-22n-7w, made new perforations at 8,852-8,902 ft., still in the Stray sand of the Cotton Valley, and continued testing. At last report the well was flowing at the rate of 20 bbl. of 43 -gravity oil in 12 hours, through ¼-in. choke, under 150 psi. pressure on tubing and 725 psi. on casing. Gas-oil ratio was 6,945 cu. ft. Previous tests were from perforations at 9,025-80 ft. Total depth was 11,757 ft., in salt, plugged back to 9,136 ft.

Gulf Refining Co. M. M. Kinnebrew, 26-20n-7w, Athens field deep test, was drilling at 10,589 ft., in the Cotton Valley. Cores from 10,380-589 ft. recovered shale with no shows.

Southwest Natural Gas Producing Co. 1 Mrs. M. E. Colvin, 31-20n-2w, 9,000-ft. wildcat, was drilling at 6,815 ft. in the Travis Peak. Top on the formation had not been released by operator. According to one source, sample tops were: Massive anhydrite 3,850-4,045 ft., Travis Peak 5,338 ft. On elevation of 167 ft., the well logged the Massive anhydrite from 3,850-70 ft., and the Pettit at 5,035 ft.

In Arkansas, C. H. Murphy 1 Pepper, NE SE NE 32-18s-15w, was fishing stuck drill pipe at 7,355 ft. at last report. Cores from 7,336-55 ft., in the Cotton Valley, recovered 3 ft. of porous sand with a show of oil, and 16 ft. of sand and shaly sand with no shows.

Two miles southeast of Schuler field, Spartan Drilling Co. 1 Sallie Irby, Union County test, NE SE 22-18s-17w, was drilling at 6,254 ft., in the Cotton Valley topped at 5,444 ft., on elevation of 286 ft. Cores from 5,951-58 ft. recovered shale and siltstone with no shows; from 6,046-53 ft. recovery was 7 in. of gray sand with light show of oil, and salty. Side-wall samples from 3,200, 4,012 and 5,654 ft. had slight shows of oil.

NORTH LOUISIANA WILDCAT FAILURES

Catahoula Parish: W. O. Woodward 1 W. C. Fairbanks, NE NW 23-7n-6e, dry, TD 6,605 ft., elev. 63 ft., no shows.

Franklin Parish: Oil Exchange, Inc., 1 J. Greenwald, NW NW NW 6-14n-8e, dry, TD 5,352 ft., elev. 79 ft., Wilcox 1,785 ft., Midway 3,153 ft., Clayton 3,652 ft., gas rock 3,658 ft., Tuscaloosa 4,100 ft., Marine Tuscaloosa 4,520 ft., Massive sand 4,880 ft., lower Cretaceous 4,925 ft., sand 5,175-95, 5,218-40 ft.

LaSalle Parish: Arkansas Fuel Oil Co. A-20 Tremont, SW SW NE 33-10n-2e, dry, TD 6,993 ft., elev. 139 ft., Wilcox 1,577 ft., Midway 3,870 ft., Arkadelphia 4,546 ft., Saratoga 5,112 ft., Tuscaloosa 5,637 ft., Marine Tuscaloosa 5,895 ft., Pilot sand 6,160 ft., Massive sand 5,235 ft., lower Cretaceous 6,284 ft., Paluxy 6,792 ft., porosity 6,955 ft.

Placid Oil Co. 127 Louisiana Central, SW NE 24-11n-3e, dry, TD 7,413 ft.

Madison Parish: H. B. Brown 2 J. K. Mahoney, 1,980 ft. W., 1,182 ft. S of NE corner, 44-17n-13e, dry, TD 4,566 ft., elev. 86 ft., top salt 4,566 ft.

ARKANSAS WILDCAT FAILURES

Miller County: C. A. Lee 1 D. P. Fawcett, SW NW SW 31-14s-28w, dry, TD 3,723 ft., elev. 288 ft., no shows.

Union County: Carnes and Milam 1 Perdue, approximately NW NW NW 33-16s-14w, dry, TD 3,449 ft.

MICHIGAN

Important Allegan Co. Test Reacidized for Better Flow

MOUNT PLEASANT.—Reacidized with 1,700 gal., Ford Oil Co. 1 Kaminski, SE SE SE 6-1n-13w, Lee Township Traverse oil discovery, Allegan County, was boosted from a 7-bbl. to a 20-bbl. producer on initial tests. Production had dropped to 3 bbl. immediately following completion late in December, when the new treatment was employed. The wildcat was acidized late last week and flowed at the increased rate for 2 hours, after which time flow was cut to 9 bbl. an hour for 8 hours and then restricted to 100 bbl. a day. After 3 days of production, a total of 700 bbl. of oil had been moved from lease to pipe-line storage.

Ford's new well is producing from the Traverse at 1,134 ft., total depth. Top of lime was logged at 1,130 ft. The strike followed a drilling program in the general area and this was the operator's fifth attempt to establish commercial production. All five wells were drilled within a radius of just over ½ mile. This success is important for two reasons: Ford established a closed structure in the district by its exploratory program and with previously drilled control points, disposing of early fears that this structure might be void of oil accumulation; this consistent and closely spaced wildcatting in an area that gradually appeared to offer favorable struc-

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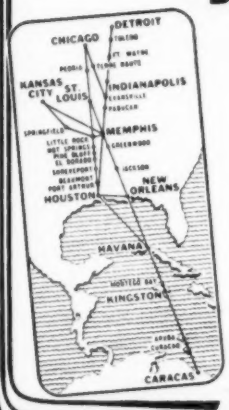

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tural and other conditions favorable appeared to be one of the best ways to locate new pools in the southern shallow Traverse area. A trend towards this close drilling and follow-up development has been shaping up in this part of the state and this new success appeared to add more strength to the theory.

MICHIGAN WILDCAT FAILURES

Allegan County, Casco Township: Stuart L. Godfrey 1 Schlaack, NE NW NW 27-1n-16w, Traverse 1,132 ft., dry, TD 1,152 ft.

Oceana County, Crystal Township: Mercer Oil Co., Inc. 1 Rudnick, NW NW SE 19-15n-16w, Monroe 2,412 ft., dry, TD 2,421 ft.

CALIFORNIA

Guijarral Hills Limits Apparently Defined

LOS ANGELES.—The completion of Signal Oil & Gas Co.'s 1 Craig-Bourdieu at Guijarral Hills probably locates the limits of production of the field. The well topped the Leda sand at 8,960 ft. with total depth at 8,986 ft. On test, it failed to flow, and bailing produced about 2 bbl. per day from the interval at 8,950-86 ft. The location, 1-21s-16e, is 50 ft. closer to production than a dry hole drilled by Standard Oil Co. of California.

An attempt to extend Fruitvale production also met with rather indecisive results. The Carl W. Weller 1 Garrett, 23-29s-27e, was completed at 4,326 ft., pumping 8-20 bbl. of 14°-gravity oil per day. Water cut ran about 80 per cent. Plans call for plugging back in an effort to get rid of the water. The Martin and Kernco sands, usually productive in this field, were found at 3,567-4,030 ft.

An attempt to prove what was reported as the first discovery of oil in Riverside County has been abandoned. Orangethorpe Oil Co. 1 Orangethorpe has been idle since late November when it pumped about 2½ bbl. of heavy oil per day from a depth of 625 ft. The well is located near Corona. The confirmation try, Frontier Petroleum Co. 1 Badger, has been declared dry at 1,060 ft. after no shows were encountered. In Section 12-5s-6w, of the same county, Victor Berghofer has made location for a test also planned to prove the Orangethorpe well. This latter venture is scheduled to 600 ft.

Near Burley, Wash., Los Nietos Co. (a subsidiary of Union Oil Co.) has taken over the 1 Hofert. This well was being drilled as a joint venture by Union and Standard of California. The test is currently below 5,000 ft.

CALIFORNIA SUCCESSFUL WILDCAT

Kern County, McKittrick area: Tide Water Associated Oil Co. 82 Veon, 25-30s-21e, flowed 14 bbl. of 35°-gravity oil per day from 4,832-4,979 ft., TD 5,363 ft., elev. 1,713 ft., PB 4,980 ft.

CALIFORNIA WILDCAT FAILURES

Kern County, Comanche Point area: Glen H. Mitchell 1 F. & M., 33-12n-18w, dry, TD 780 ft., elev. 815 ft.

Cymric area: Steele Petroleum Co. 1 Cymric, 23-29s-21e, dry, Etchegoin 3,100 ft., TD 3,346 ft., elev. 630 ft.

Tejon Hills area: Pedro Petroleum Co. 1-A, 14-11n-18w, dry, TD 750 ft., elev. 1,150 ft.

Los Angeles County, Placerita area: The Superior Oil Co. 1 L. A. H., 36-4n-16w, dry, TD 5,399 ft. in Eocene, elev. 1,348 ft.

Orange County, East Coyote area: Severns Drilling Co. 1 Armstrong, 14-3s-10w, dry, TD 3,811 ft., elev. 297 ft.

Ventura County, Ojai area: Humble Oil & Refining Co. B-1 Berylwood Investment Co., 18-4n-22w, dry, TD 5,994 ft., elev. 1,785 ft.

EASTERN TEXAS

Activity Runs High In Pine Mills Area

DALLAS.—Hollandsworth Oil Co. completed its 1 George A. Schenewerk, wildcat discovery or extension to Pine Mills field of Wood County, for 110 bbl. of oil a day on the pump, after testing for several weeks. Production is from the Woodbine perforated at 5,475-90 ft. Meanwhile, a 1,600-ft. northeast offset, F. R. Jackson et al 1 C. W. Fouke, G. B. Watkins Survey, was dry at 5,762 ft., in the Woodbine. Although the well was said to be high on the Woodbine, correlated with the discovery, it was believed to have cut a local fault. According to reports, there were no shows and no cores made in the section. The well had some oil shows in the sub-Clarksville. Electrical surveys had been run but not released at this report. Hollandsworth's second well in the area, 1 Four States Oil Co., 1,250 ft. south of the 1 Schenewerk, was drilling below 4,400 ft., still above the Austin chalk. Sohio Petroleum Co. was preparing to stake location on the C. W. Foucke estate's 61½ acres, Fisher Survey, for an east offset to the 1 Schenewerk.

J. K. Hughes had made location for a Woodbine test in the Brooks and Burleson Survey, 1½ miles east and slightly north of Pine Mills sub-Clarksville field, as the 1 B. B. Clonts, 2,943 ft. from the most northerly north line and 330 ft. from the most northerly west line of the survey and lease. In the Pine Mills townsite, Allen Guiberson and R. J. Caraway 1 C. E. Burkett, J. B. Mansell Survey, had set surface casing and was drilling ahead. It is a Woodbine test.

Atlantic Refining Co. 1 F. L. Landers Unit, E. A. Merchant Survey, confirmation well of North Lansing gas-distillate field of Harrison County, 8 miles northwest of Hallsville, was making a drill-stem test at last report. The test followed recovery of 6 ft. of porous lime with gas odor on a core from 6,640-46 ft. in the Young zone of the Rodessa. The wel was said to be checking even with Atlantic 1 M. P. Isom, discovery.

Delta Drilling Co. 1 Minnie Russell, Travis Peak wildcat 1 mile south of Blackfoot in Anderson County, was drilling below 8,750 ft., and still above the Massive anhydrite at last report. The well was said to be checking some 400 ft. low to Blackfoot field, 3 miles to the northeast. On elevation of 376 ft. it topped the upper Glen Rose at 7,650-60 ft., by samples. Nearest production in the field had the Glen Rose around 7,330 ft. on elevation of 313 ft.

EAST TEXAS (DISTRICTS 5, 6 AND 6-P) SUCCESSFUL WILDCAT

Wood County: New field or Pine Mills extension—Hollandsworth Oil Co. 1 Geo. A. Schenewerk, 5 mi. SE Pine Mills townsite in Wm. Fisher Sur., 7,500 ft. S Pine Mills field, TD 5,627 ft., elev. 413 ft., perf. Woodbine 5,475-90 ft., pumped 110 bbl. 23 -gravity oil a day.

EAST TEXAS (DISTRICTS 5, 6 AND 6-P) WILDCAT FAILURES

Denton County: Wm. H. Rouzer 1 J. W. Bowery, J. B. P. January Sur., A-658, 1 mi. NE Bolivar, dry, TD 1,722 ft.

Anderson County: Johnson 1 J. B. Parker, Wm. R. Wilson Sur., A-66, 1½ mi. S Slocum, dry, TD 5,532 ft., elev. 417 ft., base Pecan 4,520 ft., Woodbine 5,350 ft., salt water.

Freestone County: E. J. Gracey 1 Mrs. R. V. Bounds, Wm. Richie Sur., 2 mi. N Wortham, dry, TD 3,482 ft., elev. 455 ft.

Navarro County: W. Glen Weatherford 1 J. D. Pollan, Thomas W. Rowe Sur., ½ mi. NE Rice, dry, TD 970 ft., elev. 455 ft.

Upshur County: Barney Carter 1 Mrs. W. S. Peavy, Estevan Mord Sur., 4 mi. W Kelsey, dry, TD 4,860 ft., 6,300 ft. NW 1 Langford, dry hole.

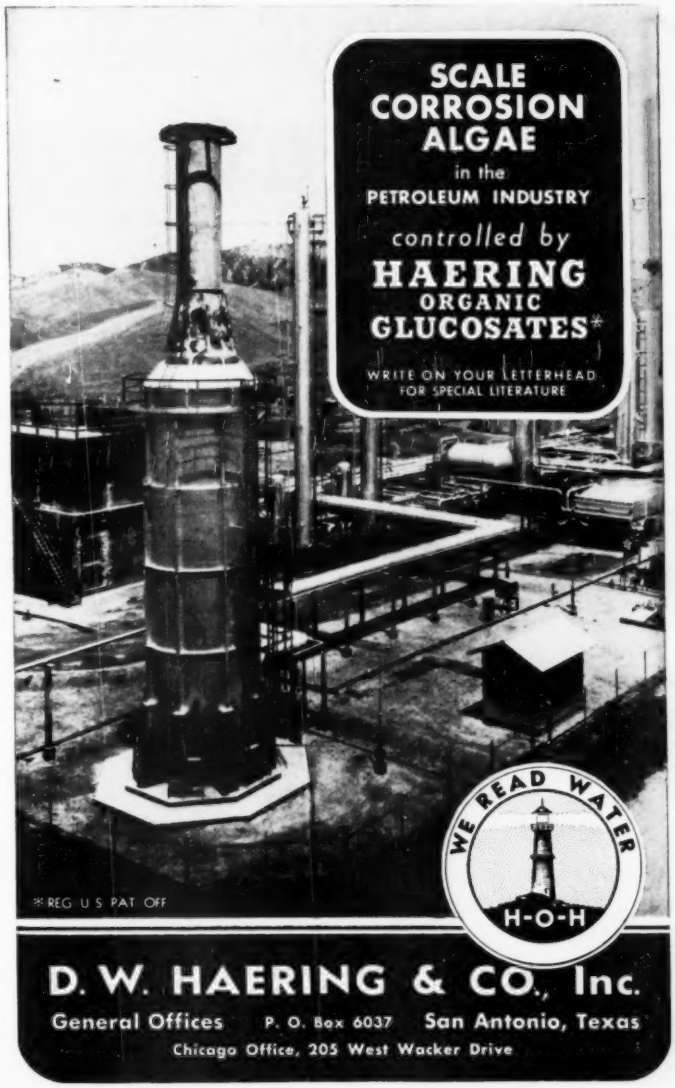
O. F. Newsome 1 J. D. Baird, Robert Burton Sur., 5 mi. SW Gilmer, dry, TD 2,232 ft., elev. 405 ft.

APPALACHIAN FIELD

Preston County, W. Va., Test Finds Gas Below 5,200 Ft.

PITTSBURGH.—In Portland district, Preston County, West Virginia, Hope Natural Gas Co.'s wildcat, 9391 John & Edna Murphy, elevation 2,152 ft., gaged 2,000,000 cu. ft. of gas at 5,248-57 ft. in the chert which was topped at 5,218 ft. Drilling is continuing at a depth of 5,267 ft. In Steele district, Wood County, location has been made for an Oriskany test: Hope Natural Gas Co. 9409 A. J. Holbert, elevation 760 ft., on the Belleville Quadrangle 1.1 miles south of Lat. 39° 5′ and 2.6 miles west of Long. 81° 30′. In the same district, Godfrey L. Cabot, Inc., 1-1313 G. P. Burkhart is running 7-in. casing at 4,662 ft. in the Corniferous lime which was topped at 4,650 ft., cable tool measurement. In Pocatalico district, Putnam County, South Penn Oil Co. 1 Frank A. Hardy gaged 5,600,000 cu. ft. of gas after shot. Tops reported were: Corniferous lime 4,760 ft., Oriskany sand 4,832 ft., gas 4,840-48 ft. Total depth was 4,881 ft. Location for the second well has been made on this farm.

In Wharton Township, Fayette County, Pennsylvania, William E. Snee et al 3 Indian Creek Coal & Coke Co., elevation 2,615 ft., topped the Oriskany sand at 7,306 ft. and is drilling at 7,327 ft. No show of gas in this formation has yet been encoun-



tered. In Georges Township, Orville Eberly et al 1 N. E. Murphy, elevation 2,560 ft., is drilling at 7,437 ft. in the Tully lime. In Croyle Township, Cambria County, Peoples Natural Gas Co. 1-3878 Joseph Gavany is drilling at 3,852 ft.

MISSISSIPPI

Big Travis Peak Pool Predicted for State

JACKSON.—The first Travis Peak production for the state has been established in the Pickens field area of Yazoo County by Carter Oil Co. 1 J. L. Wilson, 30-12n-3e. Sidewall samples from the 7,730-66-ft. interval had good showings of oil. Operators ran a drill-stem test at this depth using ¼-in. top and bottom chokes. Fluid hit the surface at end of 1 hour. Flow on the test was at the rate of 450 bbl. of 41°-gravity oil per day. Top pressure was reported to be 255-300 psi. Several other drill-stem tests were made in the 3,600-ft. pay section, and at last report operators had perforated from 7,640-57 ft. and were preparing to make another test.

The earliest additional drilling in the area will be on a Sinclair Oil & Gas Co. farm-out on the Anderson Tract in Section 22-12n-2e, to John D. Gholson. Roads are being built to a location in SW SE Section 22-12n-2e, which is approximately 3 miles west and 1 mile north of Carter's venture. The 1 Wilson was originally a Smackover lime test and showings in the Travis Peak were bypassed until drilling was completed at 12,250 ft. Some observers classify the discovery as the "biggest thing since Tinsley," a field in Yazoo County discovered in 1940, which has been the luminary of all reservoirs in the state.

In 18-10n-3e, Claiborne County, The California Co. 1 A. R. Walker et al is coring below 10,040 ft. Schlumberger was run to 9,813 ft.

ALABAMA WILDCAT FAILURE

Choctaw County: J. B. Evans, Jr. 1 J. W. Rudder et al, 31-11n-2w, dry, TD 4,024 ft.

KANSAS

West Morel Discovery Makes Maximum Rating

ANOTHER new producing spot, the second within 2 weeks for the Morel area, eastern Graham County, at the northwestern end of the Central Uplift trend of pools, has been established with the completion by Peel & Hardman and associates of their 1 Sutor, SE SE SE 18-9-21. Located a mile west of production in the Morel pool, this well has been designated as the discovery producer of the West Morel pool. It was given a maximum potential rating (3,000 bbl. per day). Production is from Arbuckle lime, topped at 3,827 ft. (—1,526 ft.). Total depth is 3,840 ft. with hole open from 3,829 ft.

About 1½ miles southwest of the Berland pool, in southwestern Rooks County, which adjoins Graham County to the east, Nadel & Gussman 1 Sutor, NE NE SE 26-10-20, has opened the Berland Southwest pool with a physical potential production of 505 bbl. per day from Arbuckle lime, topped at 3,728 ft. (—1,579 ft.). Hole was drilled to 3,733 ft. in the pay.

Petroleum, Inc., 1 Brown, SW SE SW 18-21-13, discovery well of the North Pundsack pool, located about a mile north of the Pundsack pool, in Stafford County, pumped 50 bbl. per day on potential tests with hole open at 3,675-3,682 ft. in Arbuckle lime, topped at 3,674 ft. (—1,757 ft.).

In the southern part of the same county, L. B. Stableford has opened the Copeland Southwest pool with the completion of his 1 Harter, NE NE SW 30-24-13, which is pumping about 84 bbl. of net oil daily from Simpson sand, in which casing was perforated at 4,167-71 ft.

KANSAS SUCCESSFUL WILDCATS

Ellis County: Skelly 1 Kansas "A," SW SW NW 1-14s-19w, 120 bbl. of oil per day from Arbuckle at 3,807-20 ft., TD 3,826 ft.

Previous Completions

Barton County: Franco-Central and Pickrell Drilling 1 Klug, NE NE SW 8-17s-12w, 132 bbl. of oil per day from Arbuckle at 3,376-79 ft., TD.

Graham County: Derby Oil et al 1 Balthazor, NW NW SE 13-9s-21w, 3,016 bbl. of oil per day from Arbuckle at 3,730-33 ft.

KANSAS WILDCAT FAILURES

Barton County: Aladdin 1 Kramp, SW SW NW 7-19s-12w, dry, TD 3,425 ft., Arbuckle 3,375 ft.

Aladdin 1 Rinker, SW SW NE 13-19s-12w, dry, TD 3,410 ft., Heebner 2,971 ft., Lansing-Kansas City 3,103 ft., cherty Sooy 3,361 ft., Arbuckle 3,391 ft.

Baum Development 1 Unruh, SW SW SE 28-20s-15w, dry, TD 3,806 ft., anhydrite 988 ft., Heebner 3,263 ft., Lansing-Kansas City 3,418 ft., Arbuckle 3,782 ft.

Brown County: National Assoc. 1 Titus, SE SE NE 20-2s-15e, dry, TD 3,775 ft., Maquoketa 3,696 ft., Viola 3,745 ft.

Clay County: El Capitan 1 Hill, NW NW SW 15-9s-4e, dry, TD 2,664 ft., Viola 2,602 ft.

Dickinson County: Younker & Sons 1 Larson, SW SW NW 16-16s-3e, dry, TD 3,100 ft., basal Kansas City 1,803 ft. Mississippian chat 2,552 ft., Hunton 2,689 ft., Viola 2,950 ft., Simpson 3,030 ft., Arbuckle 3,083 ft.

Ellis County: Blair 1 Herman, NW SW SW 32-12s-17w, dry, TD 3,798 ft., Sooy 3,615 ft.

Francis 1 Walter, SE SE NW 13-13s-17w, dry, TD 3,600 ft., Sooy 3,542 ft.

Graham County: Peel-Hardman 1 Schweitzer, SE SE NW 26-7s-24w, dry, TD 4,256 ft., Topeka 3,493 ft., Arbuckle 4,192 ft.

Harper County: Patton 1 Biberstein, SE SE NW 14-32s-9w, dry, TD 5,040 ft.

Lyon County: Mendenhall 1 Roberts, SE SE SE 15-18s-10e, dry, TD 1,682 ft., Kansas City 1,398 ft., basal Kansas City 1,640 ft.

Pottawatomie County: Carter 1 Browning, SE SE NW 8-8s-12e, dry, TD 3,624 ft., quartz 3,613 ft., no Arbuckle.

Rush County: Skelly 1 Schlegel, NW SE SW 14-17s-16w, dry, TD 3,677 ft., Arbuckle 3,607 ft., Regan sand 3,660 ft.

Russell County: Wakefield 1 Best, NW NE NW 13-14s-3w, dry, TD 3,342 ft., anhydrite 838 ft., Arbuckle 3,337 ft.

B & R 1 Furthmeyer, NE NE SE 15-13s-14w, dry, TD 3,318 ft., Heebner 2,922 ft., Lansing-Kansas City 2,578 ft., Sooy 3,268 ft., Arbuckle 3,310 ft.

Trego County: Continental 1 Walz, SE SE NE 14-11s-21w, dry, TD 3,797 ft., swabbed 4 bbl. of oil and 200 bbl. of salt water from Arbuckle at 3,770-81 ft.

Previous Completions

Ellis County: Heathman Drilling 1 Sullivan "C," SE SW SE 17-12s-18w, dry, TD 3,862 ft.

Jones, Shelburne & Farmer 1 Niernberger, SW SW SE 15-13s-20w, dry, TD 3,918 ft.

Lane County: Continental 1 Hagans, NW NW SE 1-17s-27w, dry, TD 4,700 ft.

Rice County: Finston & Murfin 1 Flora, NW NW SW 17-21s-10w, dry, TD 3,453 ft.

Sedgwick County: W. L. Hartman 1 Waples, NW NW SE 1-28s-2e, dry, TD 3,170 ft.

Stafford County: Westgate-Greenland 1 Rothgarn, SE SE NE 6-21s-12w, dry, TD 3,529 ft.

Wabaunsee County: Carter 1 Olson, SW NW SE 20-14s-10e, dry, TD 3,490 ft.

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OHIO, KENTUCKY

New Pool Shaping Up In Muskingum County

COLUMBUS.—Frank Brendel 2 R. A. Fairall, Section 7, a ¼-mile west extension to the pool the company is now developing in Jackson Township, Muskingum County, came in with a good oil showing natural and made 200 bbl. in the first 24-hour test after shot. The Clinton was logged at 3,197-3,257 ft.

L. L. Dittoe et al 2 Bert Clouse, Section 33, Hopewell Township, Perry County, found the Clinton at 2,950-93 ft. with 300,000 cu. ft. of gas and a fair showing of oil, natural. After a 110-qt. shot, the well flowed 50 bbl. and put 100,000 cu. ft. of gas in the line in 24 hours. The well is in the western part of Baker pool.

Two small gassers were completed in Sayre pool, Perry County. National Gas 1 Porter, Section 32, Pleasant Township, gaged 86,000 cu. ft. of gas in the Clinton at 3,699-3,751 ft. and 50,000 cu. ft. in the Medina at 3,811-13 ft. At the north end of the pool, Ohio Fuel 1 Muskingum Coal Co., Section 2, Bearfield Township, made 157,000 cu. ft. of gas natural, from the Medina at 3,924-34 ft. and 162,000 cu. ft. when shut in after shot.

OHIO WILDCAT FAILURE

Tuscarawas County, York Township: A. C. Marsh 1 W. E. Wolf, Section 5, Clinton 4,919-40 ft., TD 4,971 ft.

WESTERN KENTUCKY

OWENSBORO.—Sun Oil Co. is expanding the Morganfield South pool, Union County, on the east side by two more wells. Its 4 S. S. McBride, 1-N-19, is being put on the pump following swabbing tests with the Cypress pay at 2,258-89 ft. Its 4 Waggener, 21-O-19, to the south, swabbed at the rate of 4½ bbl. per hour while cleaning out to test the same pay at 2,264-79 ft.

In the Guffie pool, Daviess County, Cochran Brothers got a 40-bbl. pumper in their 1 Roddea, 12-N-27, completed in Benoist sand at 1,868-80 ft. Sohio Petroleum Co. 1 E. F. Labold, SW NW NW 18-N-28, West Glenville area, same county, pumped 31 bbl. of oil per day from Tar Springs sand at 1,252-66 ft.

WESTERN KENTUCKY WILDCAT FAILURE

Hancock County: C. C. White et al., 1 Bowling, SW NE SW 4-O-34, dry, TD 301 ft.

EASTERN KENTUCKY

ASHLAND.—In Estill County there are currently two wells drilling in Furnace pool: Jack Kindred et al are making hole below 1,400 ft. at 2 George Lyle, located in 25-P-69; Raydure et al are drilling at 2,189 ft. on 1 Chris Tipton, 3-O-68, generally south of established production. Objective of both wells is the St. Peter sand, found at an average depth of 2,500 ft.

In Big Sinking pool of Lee County, Kentucky Oil Co. has recently completed 2 and 3 Pat Arnold for approximately 3 bbl. each from Corniferous lime at depths of 887 ft. and 809 ft. respectively. Both wells are located on Billies Fork in the western part of the county.

INDIANA

EVANSVILLE.—A quarter-mile southeastward extension of the McClosky pay zone of the recently opened Plainville pool, Daviess County, is virtually assured at B-S-L Drilling Co. 1 B. E. Myers (Unit 3), SW NE SE 2-4n-7w. Pay was logged at 756-83 ft., and in a drill-stem test of the lower 15 ft. (768-83 ft.), the well showed gas within 23 minutes after the tester was opened, and then started flowing clean oil. This will be the fourth well for the pool.

C. E. Skiles and Barclay Oil Co. 1 Keller-Gill, a half-mile further south in the NE NW NE 11-4n-7w, at the edge of the Plainville townsite, is preparing to test showings encountered in Salem lime at a total depth of approximately 1,221 ft. National Associated Petroleum Co. 1-A L. Meuer, twin to the McClosky discovery well, in the SE SW NE 2-4n-7w, is being put on the pump to test showings found in the Devonian at a total depth of approximately 1,950 ft. This well, deepened from the Salem lime, in which it tested an estimated 3,000,000 cu. ft. of gas daily at 1,157-72 ft., is giving promise of opening a third pay zone for the area.

Joe Resnick 1 Lillian Butler, NE SW NE 15-4s-10w, which opens a new producing area in southern Gibson County, near the Vanderburg County line, pumped 25 bbl. of oil daily at completion in Jackson sand at 1,800-09 ft. It is about 2 miles from production in the Stacer and Warrenton areas.

INDIANA SUCCESSFUL WILDCAT

Posey County: A. B. Barrow 2 Stuck, 20-6s-13w, IP 10 bbl., Marsfield 1,504-07 ft., TD 2,534 ft. (Extension Farmersville pool).

INDIANA WILDCAT FAILURES

Gibson County: B. M. Heath 1 Knowles, SW NE NW 23-3s-12w, dry, TD 1,928 ft.

Hamilton County: J. E. Jolly 1 Kinsey, SE SW SW 12-18-4e, d. y. TD 500 ft.

SOUTH LOUISIANA

Tight Hole Offshore Gets Good Shows

NEW ORLEANS.—Shell Oil Co. is reported to have logged good showings of oil and gas-condensate in the 1 State

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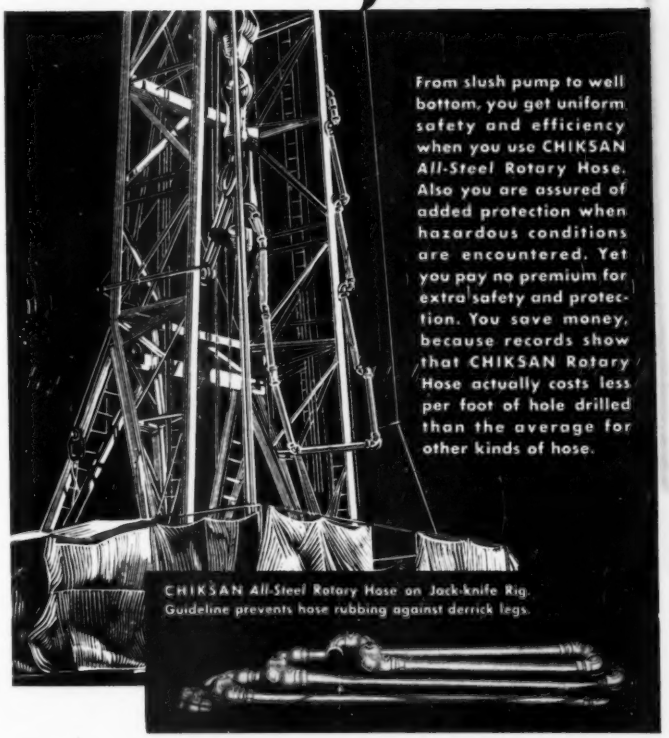

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BALL-BEARING SWIVEL JOINTS FOR ALL PURPOSES

Lease 1,008, the South Main Pass area, offshore from Plaquemines Parish. Depth of the showings are not known in this "tight" hole. At last report, the well was bottomed at 10,006 ft. Projected depth is 12,000 ft.

A new sand has been tapped in Lake Hermitage field, Plaquemines Parish, with completion of Gulf Refining Co.'s 20 State Lease 707-Lafourche Basin Levee district. The well is bottomed at 11,788 ft. and was gaged through a 9/64-in. choke for 160 bbl. of 37.1°-gravity oil per day, with 800 psi. pressure on the tubing. Production is through perforations at 11,718-40 ft.

Magnolia Petroleum Co. finaled the 1 Ragley Lumber Co., 20-5s-7w, Beauregard Parish wildcat, for 12 bbl. of 45.3°-gravity oil per day through 10/64-in. choke. Hole is bottomed at 10,855 ft. and is producing through perforations at 8,250-60 ft. Operator has temporarily abandoned the well and will rework it at a later date.

Two miles northwest of Springville townsite, Livingston Parish, Southeastern Producing Co. et al continue to core the 8,044-ft. zone in the 1-L Gaylord. Operators encountered no shows in cores from 7,975-8,044 ft. The projected 8,300-ft. wildcat locates in C NW SW Section 9-7s-5e.

SOUTH LOUISIANA SUCCESSFUL WILDCATS

Acadia Parish: Gas-distillate discovery in Maxie area—Hassie Hunt Trust 1 S. W. Robison et al, 31-8s-1e, ¾ mi. S Maxie townsite, 1½ mi. W N. Crowley production, TD 11,400 ft., 39 bbl. of distillate from 10,637-42 ft., 8/64-in. choke, TP 3,600 psi., 52° gravity.

Beauregard Parish: Oil discovery—Magnolia Petroleum Co. 1 Ragley Lumber Co., 20-5s-7w, 7½ mi. E Longville, TD 10,855 ft., 12 bbl. of oil per day from 8,250-60 ft., 10/64-in. choke, GOR 1,200, TP 1,000 psi., 45.3° gravity.

Plaquemines Parish: New pay at Lake Hermitage—Gulf Refining Co. 20 St. Lease 707-Lafourche Basin Levee Dist., 3-18s-25e, TD 11,788 ft., 160 bbl. of oil per day from 11,718-40 ft., 9/64-in. choke, GOR 496, TP 800 psi., 37.1° gravity.

St. Mary Parish: Gas discovery—Eugene Isle Block 45, offshore, TD 14,048 ft., 1,350,000 cu. ft. of gas per day from 9,449-51 ft., 8/64-in. choke, TD 3,500 psi.

OKLAHOMA

Southwest Goldsby Pool Gets Confirmation Well

DANCIGER OIL & REFINING CO. has what appears to be a second good well for the Southwest Goldsby pool, in eastern McClain County, at its 1 Mayer, C SW SE 35-8n-3w. With casing perforated at 10,177-180 ft. in Joins sand, a new pay zone for the pool, the well flowed at the rate of 12 bbl. of oil per hour through ¼-in. choke.

This well originally was drilled by Magnolia Petroleum Co. to 9,462 ft. in the Bromide, where it was abandoned as noncommercial. Danciger, following the deepening, late last year, of the discovery well, a former Bromide producer, and finding production in lower zones in that well, went back into this hole and drilled it to a total depth of 10,260 ft. For the deepening, a protective string of 7-in. casing was run to 9,492 ft., and for completion 5-in. liner was run to 10,257 ft.

Location of the new producer is about a half-mile east and a little south of the discovery well. The latter currently is producing from the Tulip Creek sand, in which casing was perforated at 9,719-24 ft. It, however, was drilled to a total depth of 10,292 ft., where it found good showings in a succession of zones, including not only the Tulip Creek, but also the McLish, first and second Oil Creek, and the Joins sand, the latter at 10,203-87 ft.

On the west flank of the Knox pool, in Grady County, Shell Oil Co. has a good producer in its 4-B Burkes, NE SE SE 17-3n-5w, which has been completed flowing 305 bbl. of oil in 9 hours through ½-in. choke. Production is from a sand section in which casing was perforated at 2,663-72 ft., 2,616-34 ft., 2,577-98 ft., and 2,489-2,503 ft. Total depth is 2,717 ft. with casing at 2,710 ft. and hole plugged back to 2,678 ft.

Sun Drilling Co. 1 Seay, NE SE SE 22-6s-5w, which is opening a new shallow sand pool in the extreme southern part of Jefferson County, is being put on the pump after swabbing tests in which it made about 16 bbl. of 36° oil per day. Casing, cemented at 2,648 ft., was perforated at 2,519-32 ft. Total depth is 2,671 ft. This well is about 4 miles west of Grady and north of the shallow Oscar pool.

In the meantime, the same company has another prospective discovery in its 1 Samuel, SW NW NW 20-6s-5w, about 2½ miles to the west of the Seay well and northeast of the Spring pool, where favorable showings were found both in a shallow sand at 1,601-21 ft. and in the Arbuckle lime, topped at 1,861 ft. A recovery of 360 ft. of free oil and 330 ft. of oil-cut mud was made in a drill-stem test of the shallow sand. In the Arbuckle, a drill-stem test was made at 1,871-83 ft., in which 60 ft. of heavily oil-cut mud was recovered. At latest report, the hole was being cored ahead with additional saturation being found.

Alpha Petroleum Corp. and Jordan Petroleum Corp. 1 McKey, NW SW NW 6-16n-1e, east offset to the discovery well of the recently opened South Langston pool, Logan County, is providing confirmation of production in that area. In Misener sand, pay zone of the discovery well, at 5,030-45 ft., it is reported to have flowed at the rate of 25 to 30 bbl. of oil per hour.

OKLAHOMA SUCCESSFUL WILDCATS

Canadian County: Extension to W. Edmond—Mid-States Oil 1 Pfile, C SE SW 11-14n-5w, flowed 13 bbl. of distillate from Bartlesville at 6,914-30 ft., 19/64-in. tubing choke, TD 6,955 ft.

Murray County: Pennington 1 Hassen, SW

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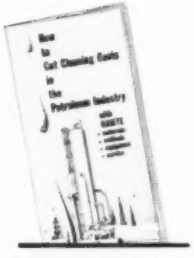

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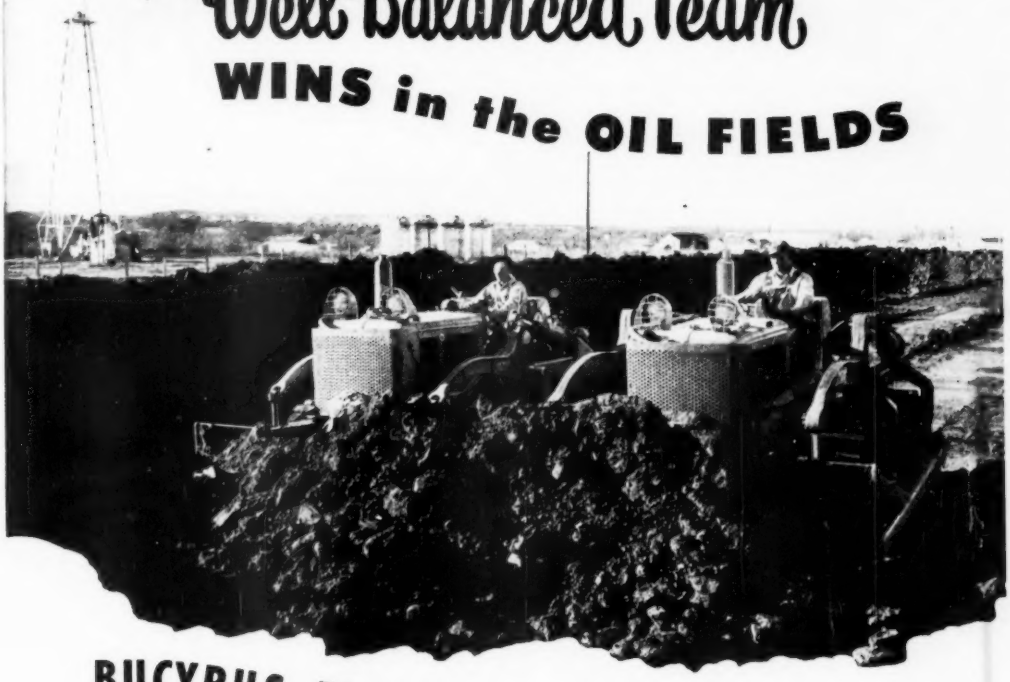

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SE NW 20-1n-3e, pumped 10 bbl. of 28°-gravity oil per day from sand at 865-911 ft., TD 996 ft.

Stephens County: Crosbie, Inc., 1 Evans, SE SE SW 33-1n-4w, pumped and flowed 63 bbl. of 34°-gravity oil per day from sand at 5,032-5,127 ft., TD 5,130 ft., lower Senora 4,232 ft., Tussy lime 4,619 ft., Williams sand 4,980 ft., Evans sand 5,033 ft., Pickens sand 5,097 ft.

Gulf Oil 1 Jones, C SE SE 26-2n-8w, flowed 84 bbl. of 62.7°-gravity distillate from bromide sand at 7,720-7,978 ft., TD 8,376 ft.

OKLAHOMA WILDCAT FAILURES

Cotton County: Richardson 1 McCoy, NE SE SE 10-1s-10w, dry, TD 2,810 ft., limy sand 2,400-14 ft., 2,440-56 ft., 2,510-20 ft., and 2,646-58 ft.

Kingery 1 Chock-Poeath, SW SW NW 5-2s-9w, dry, TD 3,065 ft., sand 2,200-08 ft. and 2,420-50 ft., shaly sand 2,630-40 ft. and 2,700-08 ft., sand 3,015-45 ft.

Cummings 1 Graham, SW NW SW 32-3s-10w, dry, TD 1,509 ft., no log.

Kewanee 12-Wook-Kah-Nah, E 2 NE SW 1-4s-11w, dry, TD 4,287 ft., conglomerate 1,212 ft. with show of oil, sand 1,289 ft. with show of oil, shale 1,323 ft., sand 1,337 ft. with show of oil, Megargel 1,727 ft., sand 1,798 ft., Gunsight 1,890 ft., sand 1,900 ft. and 1,936 ft., Canyon 2,376 ft., basal Canyon 3,112 ft., sandy lime and conglomerate 4,075 ft., granite wash and lime 4,105 ft. (geological test in Cache Creek field, to be used as salt water disposal well).

Garvin County: Norris 1 Adams, NE NE NE 28-3n-1w, dry, TD 4,970 ft., basal Pennsylvanian-Viola 2,475 ft., first bromide sand 4,625 ft., second bromide sand 4,815 ft.

Hughes County: Carnation Petroleum 1 Scott, NW NW NE 22-7n-9e, dry, TD 4,212 ft., Senora lime 1,220 ft., Senora sand 1,237 ft., lime 2,720 ft., upper Booch 2,855 ft., lower Booch 2,996 ft., Hartshorne 3,110 ft., Gilcrease 3,530 ft., Wapanucka 3,790 ft., Union Valley 4,159 ft., Cromwell 4,172 ft.

Jefferson County: Hammon 1 Johnson, NW NW SE 9-6s-8w, dry, TD 4,260 ft., Simpson dolomite 4,140 ft., white sand 4,160 ft.

Lincoln County: The Texas Co. 1 Frost, SW SE NW 18-12n-3e, dry, TD 5,490 ft.

Okfuskee County: Gillespie & Sons 1 Fleming, NW SW SW 5-10n-11e, dry, TD 2,462 ft., lime 2,215 ft., Booch 2,405 ft.

Okmulgee County: Fitzhugh 1 Adams, NE SE NW 4-15n-12e, dry, TD 2,636 ft., lime 2,085 ft., sand 2,165 ft., with slight show of oil, lime 2,195 ft., Mississippi lime 2,350 ft., Woodford 2,542 ft., Viola 2,607 ft., Wilcox 2,627 ft.

Stewart 1 Severs Ranch, SE NW NW 14-15n-14e, dry, TD 2,555 ft., sandy lime 2,530 ft., Arbuckle 2,537 ft. (geological test in Bald Hill field).

Pittsburg County: Sunray 1 Mullins, C SE SW 29-4n-14e, dry, TD 7,058 ft. in Atoka.

Pontotoc County: Robinson & Marshall 1 Bates & Chism, SW SW NE 28-5n-7e, dry, TD 2,940 ft., Calvin 538 ft., Henryetta coal 894 ft., lime 1,102 ft., Inola 1,587 ft., lime 1,951 ft., Booch 2,058 ft., Gilcrease 2,192 ft., Wapanucka 2,512 ft., Union Valley 2,590 ft., Cromwell 2,670 ft., Pennsylvanian Caney 2,860 ft.

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ILLINOIS

Wayne County Wildcat Completed as Producer

MATTOON. — Robinson - Puckett, Inc., 1 Manahan, SW NW NE 23-1s-6e, which opens a new producing spot 5 miles north of Wayne City in the gap between the south ends of the Johnsonville Consolidated and Clay City-Noble Consolidated pools, in Wayne County, pumped 160 bbl. of oil with a small amount of water per day at completion. Pay zone is McClosky lime at 3,184-88 ft., where casing, run to 3,285 ft., was perforated. Total depth is 3,294 ft. Pay zone was acidized with 2,000 gal.

C. E. Skiles and E. E. Rehn 1 Alford, NE NW NE 18-6s-11e, an outpost test on the east side of the Maunie South pool, White County, recovered 480 ft. of clean oil and 60 ft. of mud-cut oil in a drill-stem test of Cypress sand at 2,594-2,607 ft. Casing has been run and cable tools are being moved in to complete.

Calvert Drilling Co., Inc., and Walter Duncan are extending production of the Rural Hill pool, Hamilton County, to the northeast at their 1 Suttle, SW NW SW 4-6s-6e. The well swabbed at the rate of 5½ bbl. of oil per hour while testing Aux Vases at 3,097-3,136 ft., and now is being put on the pump. Total depth is 3,261 ft.

ILLINOIS SUCCESSFUL WILDCAT

Saline County: W. O. Morgan 1 Cole, NE NE SE 20-7s-6e, IP 47 bbl., McClosky 3,188-3,211 ft., TD 3,264 ft. (Opens new pool).

ILLINOIS WILDCAT FAILURES

Coles County: E. Zink 3 Childress, NE NE NE 19-13n-14w, dry, TD 415 ft.

Edgar County: Fullenkamp et al., 2 Baber, SW SW SE 28-13n-13w, dry, TD 484 ft.

C. E. Skiles 3 Tate, NE SE NW 29-13n-13w, dry, TD 463 ft.

Madison County: L. L. Benoist 1 Vertobsek, NW NW NE 33-6n-6w, dry, TD 845 ft.

L. Updike 1 Best, SW NW SE 12-6n-7w, dry, TD 550 ft.

Moultrie County: P. Doran et al., 1 Pierce, NW NE SE 33-13n-6e, dry, TD 2,072 ft.

Perry County: Kingwood Oil Co. 1 Hincke, NE NW SE 3-6s-3w, dry, TD 1,385 ft.

Richland County: Sun Drilling Co. 1 Bogard, NW NW NE 18-2n-11e, dry, TD 3,315 ft.

Washington County: Leo Horton and M & M Drilling Co. 1 Dallman, SW SW SE 34-3s-2w, dry, TD 4,035 ft.

UNLIMITED SERVICE-LIFE *is just* ONE ADVANTAGE *of*

When you install **HANCOCK GATE WELDVALVES...**

you are assured of freedom from valve seat leakage and replacement! For Hancock's integral stellite seats positively prevent leaks between body and seating surface, never need to be renewed! They guarantee valve service-life far beyond requirements of the equipment on which the valves are used.

HANCOCK GATE WELDVALVES *give you these* PLUS FEATURES!

DISSIMILAR MATERIALS In Seats and Wedges mean an extra guarantee of long-life, no galling! Perfect alignment and tightness assured.

SELF-STORING GLAND is a real "plus" for the operator! No wiring, no tying in place and plenty of room and length along the stem to get at the packing.

NO STEM PITTING because stems in all Hancock Gate WELDVALVES are completely coated with a heavy cadmium plating!

YOKE POST and Gland Nut Threads Protected regardless of years of service, corrosive atmospheres! A number of threads on the yoke post studs are always covered, protected, workable.

PACKING EASE because there's plenty of packing space, packing of the highest quality, packing for the widest range of services.

SAFE HANDWHEEL protects the operator in "hot" services!

INTERCHANGEABLE PARTS. All wedges, stems and thread bushings made to exact ng uniformity!

CORROSION RESISTANT Back Seating allows stuffing box shut-off around stem when fully opened!

BAKED ENAMEL Exterior Finish means maximum protection from corrosion of all external parts.

You can depend upon your Hancock Distributor for prompt service

MAXWELL MANNING M&M & MOORE INC. TRADE MARK

HANCOCK *Valves*

1877 HANCOCK U.S.A.

A PRODUCT OF

MANNING, MAXWELL & MOORE, INC.

WATERTOWN 72, MASSACHUSETTS

Makers of 'Hancock' Valves, 'Ashcroft' Gauges, 'Consolidated' Safety and Relief Valves, 'American' Industrial and 'Microsen' Electrical Instruments. Builders of 'Shaw-Box' Cranes, 'Budgit' and 'Load-Lifter' Hoists and other lifting specialties.

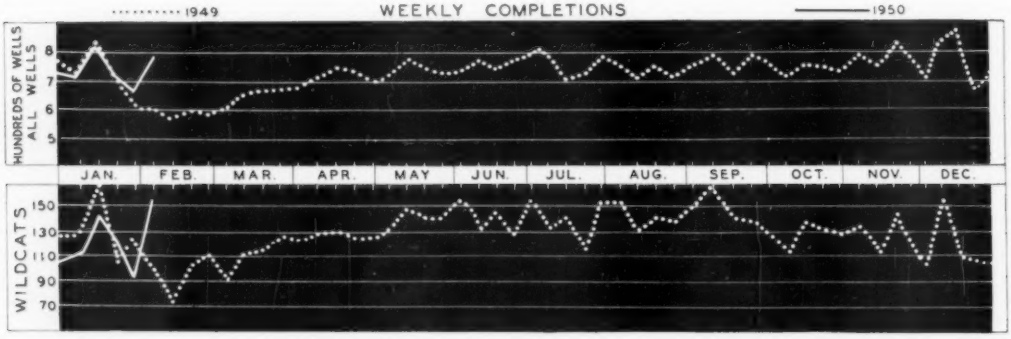
CURRENT STATISTICS

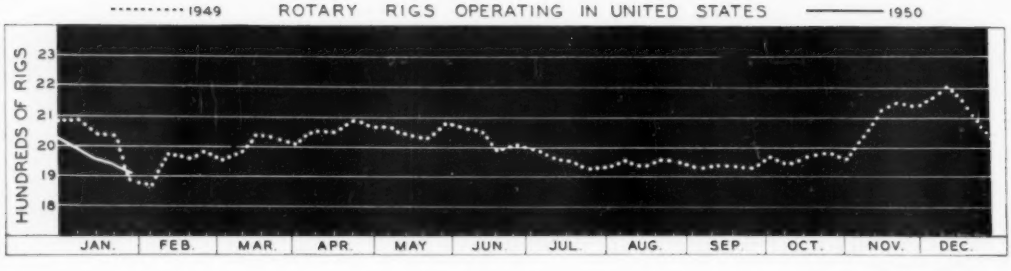
EXPLORATION

WEEKLY WELL COMPLETIONS . . . WEEK ENDED FEBRUARY 4, 1950

	Total of all wells					Feb. 4		Wildcat completions and discoveries									
													Cumulative total, 1950				
	Comp.	Oil	Gas	Dry	Footage	1950	1949	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	14	7	0	*7	19,068	72	100	0	0	0	0	0	0	0	0	0	0
Pennsylvania	21	7	4	†10	36,760	112	182	0	0	0	0	0	0	0	0	0	0
West Virginia	11	3	6	2	30,545	56	53	0	0	0	0	0	0	0	2	1	3
Ohio	19	7	4	18	50,999	84	116	0	0	0	1	1	1	0	0	2	3
Indiana	17	6	0	11	27,859	96	105	1	0	0	2	3	4	0	1	10	15
Kentucky	14	6	4	4	21,759	88	64	0	0	0	1	1	2	0	0	7	9
Illinois	46	24	0	22	89,727	237	158	1	0	0	9	10	3	0	0	50	53
Michigan	8	4	0	4	18,623	73	91	0	0	0	2	2	6	0	0	25	31
Kansas	88	43	8	§37	296,770	310	275	3	0	0	23	26	7	0	0	48	55
Neb., Mo., Iowa	1	1	0	0	2,552	7	0	0	0	0	0	0	0	0	0	4	4
Oklahoma	93	52	3	‡38	354,312	432	352	2	2	0	13	17	14	2	2	56	74
Texas	326	205	14	107	1,398,407	1,451	1,216	10	0	7	54	71	38	4	17	192	251
North Central (Dist. 7-B & 9)	103	45	5	53	322,594	422	374	4	0	3	18	25	10	1	3	56	70
West (Dist. 7-C & 8)	96	83	0	13	520,673	378	275	2	0	0	6	8	12	0	0	41	53
Panhandle (Dist. 10)	26	21	2	3	100,166	138	114	1	0	2	3	6	1	0	2	3	6
Eastern (Dist. 5, 6, & 6-P)	19	10	2	7	70,143	110	63	1	0	0	6	7	2	1	1	21	25
Gulf Coast (Dist. 2 & 3)	43	29	3	11	210,827	204	189	0	0	0	6	6	5	1	3	29	38
Southwest (Dist. 1 & 4)	39	17	2	24	174,004	199	201	2	0	2	15	19	8	1	8	42	59
Louisiana	50	34	2	10	321,079	267	220	2	1	1	5	9	9	4	2	19	34
Northern	26	16	1	9	108,165	140	130	0	0	0	5	5	2	0	0	13	15
Southern	24	18	1	5	212,914	127	90	2	1	1	0	4	7	4	2	6	19
Arkansas	7	4	0	3	21,879	38	15	0	0	0	2	2	0	0	0	11	11
Mississippi	7	5	0	2	43,872	32	32	0	0	0	0	0	0	0	0	7	7
Southeastern States	1	0	0	1	4,024	5	5	0	0	0	1	1	0	0	0	2	2
Montana	0	0	0	0	0	16	20	0	0	0	0	0	0	0	0	4	4
Wyoming	11	7	0	4	57,556	68	54	0	0	0	1	1	3	0	0	11	14
Colorado-Utah	0	0	0	0	0	15	20	0	0	0	0	0	0	0	0	11	11
New Mexico	25	17	2	6	120,877	76	48	3	0	0	2	5	4	0	0	6	10
California	34	26	0	8	166,168	171	258	1	0	0	6	7	4	0	1	25	30
Dakotas	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1
Total United States	793	458	47	288	3,082,836	3,707	3,424	23	3	8	122	156	95	10	25	492	622
Total previous week	662	377	44	241	2,626,201			9	2	1	80	92	72	7	17	370	466
Total February 5, 1949	602	325	59	218	2,156,117			17	0	5	84	105	90	4	17	520	631

Service wells included: *7, †9, ‡1, §3, °2, ¶4.





DAILY AVERAGE PRODUCTION FOR WEEK

	Feb. 4 crude oil	B. of M. Feb. demand	Jan. 28 crude oil
Alabama	1,650	1,200	1,650
Arkansas	79,800	82,000	79,750
California	867,300	832,000	866,900
Colorado	60,500	67,000	59,700
Eastern	60,300	59,900	57,500
Florida	1,050	1,000	975
Illinois	180,500	180,000	178,100
Indiana	25,800	29,000	26,300
Kansas	264,500	290,000	283,300
Kentucky	24,900	24,000	25,600
Louisiana	544,075	542,000	539,120
North Louisiana	121,550		121,100
South Louisiana	422,525		418,020
Michigan	44,200	45,000	44,400
Mississippi	99,800	99,000	99,350
Montana	24,500	25,000	24,800
Nebraska	1,650	700	1,400
New Mexico	130,975	130,000	131,220
Oklahoma	410,800	415,000	392,500
Texas	1,921,850	2,170,000	1,929,000
Dist. 1 (Southwest)	25,875		26,200
Dist. 2 (Southwest)	111,550		112,850
Dist. 4 (Southwest)	178,550		187,200
Dist. 3 (Gulf Coast)	361,600		357,575
Dist. 5 (Eastern)	32,225		32,550
Dist. 6 (Eastern)	81,075		81,425
East Texas field	217,875		222,000
Dist. 7-C (West)	46,925		46,950
Dist. 8 (West)	578,350		572,850
Dist. 7-B (W. Central)	62,125		62,300
Dist. 9 (N. Central)	135,150		143,500
Dist. 10 (Panhandle)	90,550		92,600
Utah	2,400	1,200	2,400
Wyoming	132,500	126,000	131,900
Total United States	*4,879,050	5,120,000	4,875,865
Change from pervious week, up 3,185			
Canada	60,290		60,655

Total U. S. production January 1-February 4 †173,664,305 bbl.
Same period last year (crude plus cond.) 193,014,625 bbl.

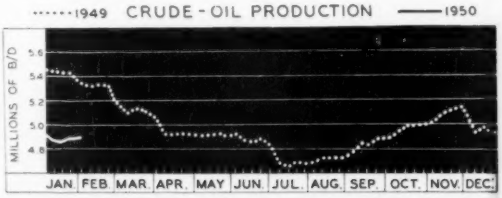
*Not incl. 97,145 bbl. condensate. †Incl. 3,192,525 bbl. condensate.

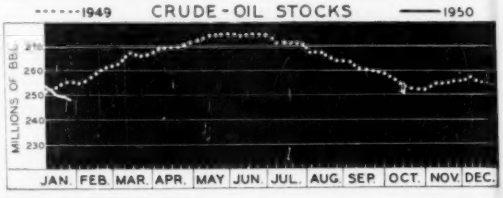
CRUDE-OIL STOCKS BY STATES OF ORIGIN*

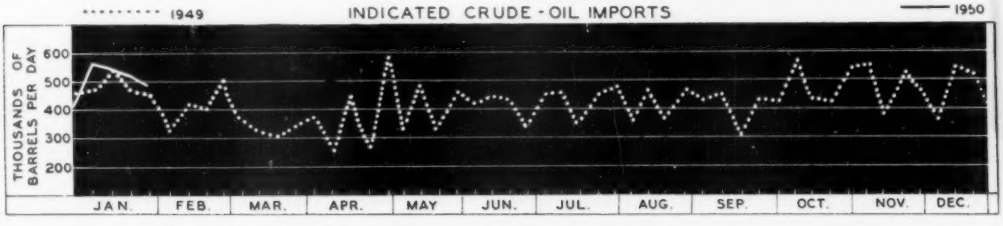
(Thousands of barrels)

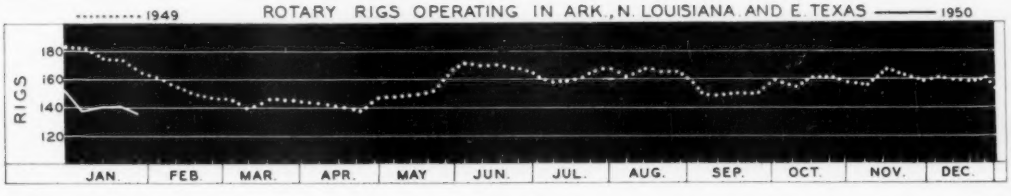
	Jan. 28, 1950	Jan. 21, 1950	Jan. 29, 1949
Pennsylvania Grade	2,697	2,731	2,848
Other Appalachian	1,890	1,760	1,433
Illinois, Indiana, Michigan	10,798	10,915	14,035
Arkansas	3,150	3,155	3,269
Louisiana	14,351	14,122	12,699
North	3,617	3,545	3,165
Gulf	10,734	10,577	9,534
Mississippi	2,447	2,488	2,704
New Mexico	7,268	7,343	6,756
Oklahoma and Kansas	36,771	36,874	36,218
Texas	110,965	111,567	121,557
East Texas	14,862	15,022	15,699
West Texas	39,675	40,419	48,751
Texas Gulf	29,601	29,603	29,239
Other Texas	26,827	26,523	27,867
Rocky Mountain	13,187	13,218	12,659
California	37,566	37,512	32,779
Foreign	7,321	7,439	8,502
United States	243,411	249,124	255,459

*Bureau of Mines.









A.P.I. REFINERY REPORT, JANUARY 28

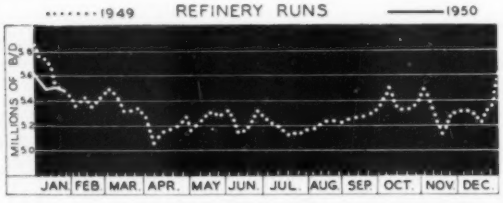
(Thousands of barrels)

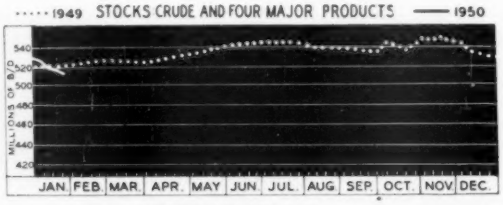
District	Daily avg. crude runs	Daily average production: Gasoline*	Kerosine	Distillate	Residual	Stocks at refineries, bulk terminals, in transit and in pipe lines: Gasoline	Kerosine	Distillate	Residual
East Coast	871	357.9	38.6	179.0	218.6	26,132	8,679	23,115	11,561
Appalachian:									
District 1	87	28.3	7.6	16.4	9.7	2,652	364	746	327
District 2	67	37.0	6.8	7.3	15.6	1,262	118	213	115
Ind., Ill., Ky.	972	478.3	64.6	175.7	179.3	25,455	3,322	8,348	3,502
Okla., Kans., Mo.	455	265.4	26.0	80.7	58.0	12,726	853	4,085	1,172
Inland Texas	190	145.9	10.3	23.6	40.0	4,205	336	757	661
Texas Gulf Coast	1,252	594.1	120.7	200.0	221.0	18,292	2,185	12,083	5,478
La. Gulf Coast	444	201.4	78.0	55.0	54.8	6,482	1,364	3,712	2,229
N. La. and Ark.	83	23.9	7.3	11.0	14.3	3,140	229	499	250
Rocky Mountain:									
New Mexico	12	6.1		2.0	2.7	95	25	80	30
Other Rocky Mt.	171	79.4	5.7	33.8	40.0	4,232	200	1,352	645
California	866	369.6	18.1	158.6	344.4	19,597	874	11,347	31,026
January 28, 1950	5,470	2,623.3	383.7	1,043.1	1,198.4	124,270	18,449	66,337	57,036
January 21, 1950	5,513	2,569.7	380.4	1,068.9	1,180.9	122,264	19,046	69,214	58,585
January 29, 1949	5,558	2,504.4	369.7	1,083.1	1,277.3	114,970	21,774	63,142	63,333

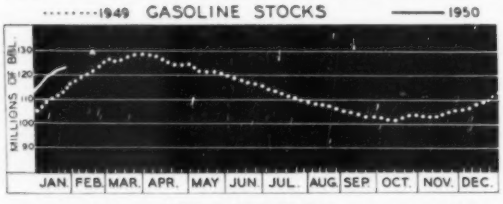
Bureau of Mines, January 1949

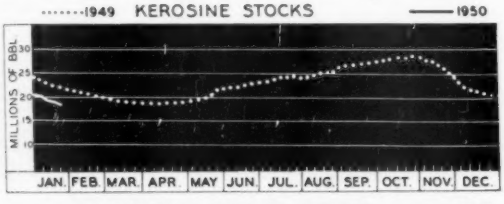
	Daily avg. crude runs	Daily average production: Gasoline*	Kerosine	Distillate†	Residual
	810	312.8	33.6	192.9	223.3

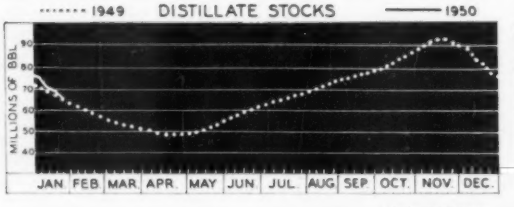
*At refineries including natural blended. †Finished and unfinished.

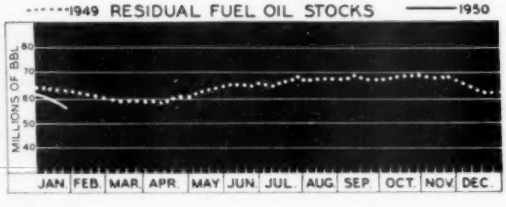


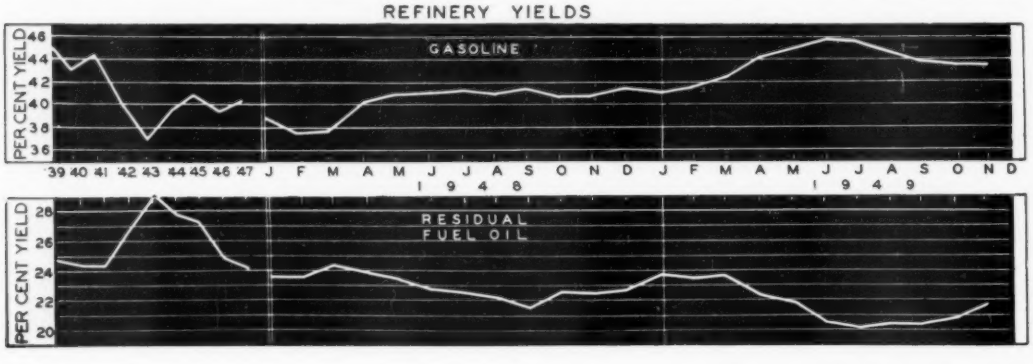











REFINERY YIELDS
GASOLINE
PER CENT YIELD
39 40 41 42 43 44 45 46 47 J F M A M J J A S O N D J F M A M J J A S O N D
1948
1949
RESIDUAL FUEL OIL
PER CENT YIELD

CRUDE PRICES
GRAVITY SCHEDULE

Gravity—	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast Tex.*	West Tex.†
18-18.9	$1.53			
19-19.9	1.63			
20-20.9	1.73	$2.25		$2.12
21-21.9	1.82	2.27		2.14
22-22.9	1.92	2.29		2.16
23-23.9	2.02	2.31		2.18
24-24.9	2.12	2.33	$2.56	2.20
25-25.9	2.22	2.35	2.58	2.22
26-26.9	2.31	2.37	2.60	2.24
27-27.9	2.37	2.39	2.62	2.26
28-28.9	2.42	2.41	2.64	2.28
29-29.9	2.48	2.43	2.66	2.30
30-30.9	2.54	2.45	2.68	2.32
31-31.9	2.59	2.47	2.70	2.34
32-32.9	2.64	2.49	2.72	2.36
33-33.9		2.51	2.74	2.38
34-34.9		2.53	2.76	2.40
35-35.9		2.55	2.78	2.42
36-36.9		2.57	2.80	2.44
37-37.9		2.59	2.82	2.46
38-38.9		2.61	2.84	2.48
39-39.9		2.63	2.86	2.50
40 and above		2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point.

†Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947. Above changes do not include recent reductions of a few buyers applying principally to low-gravity grades.

FLAT CRUDE PRICES

Representative posted schedules per barrel

East Texas†	$2.65
Kettleman Hills, California*	2.77
Beauregard Parish	2.60
Illinois Basin	2.77
Pecos County, Texas (Yates)	2.35
Bradford, Pennsylvania	3.54
Eastern Ill. and Western Ind.†	2.77
Tomball, Texas Gulf Coast	2.83

*37°-37.9°, †35° and above

FUEL markets were again highlighted by additional weakness on the East Coast and still firmer markets in the Mid-Continent and North Central areas.

Declining East Coast sales of No. 2 fuel during the month of January resulted in increased discounts off the generally posted price of 8.5 cents a gallon until these discounts reached 0.6 cent. The shift from the voluntary discount to a flat posting of 7.9 cents for New York Harbor barge deliveries of No. 2 indicated that some suppliers decided that the market weakness was not temporary. However, the new base price was hardly established before new voluntary discounts were necessary to meet competition. Current "low" is 7.6 cents a gallon with unconfirmed reports of movement of some distress material at a little less.

Softening East Coast prices are affecting the Gulf Coast market. Most of the Gulf Coast cargo liftings of No. 2 during December and January were made at 7 cents a gallon or better. However, the fuel moving in New York Harbor at 7.6 cents cannot be replaced profitably with No. 2 costing 7 cents at the Gulf. This resulted in a period of very little spot movement out of the Gulf except for up-the-river shipments. Most suppliers expect further price cuts unless East Coast demand improves.

The Mid-Continent tank-car situation continued very tight. Buyers are having about as much trouble locating cars as they have had finding light fuel. One buyer reported that a large portion of the tank-car movement is for more distant points, thus adding to the problem of car availability. Since contract demand has been taking most of the light fuel output from Mid-Continent refineries, open-market trading has been very low.

REPRESENTATIVE QUOTATIONS

Representative spot-market quotations of leading suppliers as of February 6, 1950. Figures are f.o.b. plant for tank-car shipments in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor (barge)	Tex. Gulf Coast
Regular gasoline, 74-76 octane	9⅜-9⅞	10.5-11.1	9-9¾
Premium gasoline, 78-80 octane	10⅜-10⅞	11.5-12.1	9¾-10¾
42-44 w.w. kerosine	8½-8¾	9-9.1	8-8½
No. 2 straw fuel oil	7⅝-7⅞	7.6-7.9	6¾-7¼
No. 6 residual	$1.40-1.55	$2.05	$1.65-1.75

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	5⅞	5⅜	5⅝
Grade 18-55	7.1	6.5	6.8

LUBRICATING OILS

South Texas

200 vis., No. 2-3 neutral	10.5
750 vis., No. 3-4 neutral	12.75
2,000 No. 5-6 neutral	14-14.5

LUBRICATING OILS

Mid-Continent

150-160 vis., D bright stock, 0-10 pp.	17
200 vis., No. 3 neutral, 0-10 pp.	11.5-13

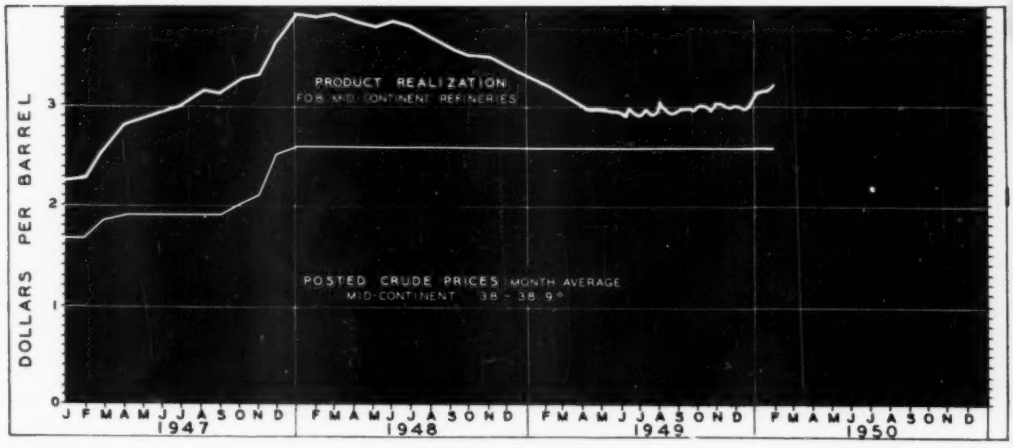
Western Pennsylvania

145-155 vis., 10 p.t. bright stock	19.5-20.5
180 vis., 0 p.t. neutral	20.5-21.5

WAX

Mid-Continent

132-134 A.M.P.	4.25

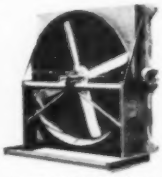

PRODUCT REALIZATION
FOR MID-CONTINENT REFINERIES
POSTED CRUDE PRICES 1 MONTH AVERAGE
MID-CONTINENT 38 - 38.9°
DOLLARS PER BARREL
0
1
2
3
J F M A M J J A S O N D
1947
F M A M J J A S O N D
1948
F M A M J J A S O N D
1949
F M A M J J A S O N D
1950

In this trend chart refinery realization is based on average Mid-Continent grade crude oil (not 38° gravity only) and average prices for refinery products as published in The Oil and Gas Journal basis Oklahoma (Group 3). Refinery yields confined to gasoline, kerosine, distillate, and fuel oil

Specify YOUNG
FOR COMPLETE COOLING
FROM A SINGLE SOURCE

Pipe line terminal station of the Union Oil Company of California at Avila, California, using Young Jacket Water Coolers and Heat Exchangers.

Integrated installations of several kinds of heat transfer equipment are common in Young Engineering experience. The Union Oil Company (see above) uses jacket water coolers to cool three 450 hp Diesels pumping up to 21,000 barrels per hr. The top half of each cooler handles the lube oil cooling water, the lower half cools the engine jacket water. A Young heat exchanger, rated to the job, cools the lubricating oil. Standard parts make possible quick delivery, economical maintenance. Find out if you're getting the most for your cooling dollar, mail coupon for full details.



Young Jacket Water Coolers, for gas, gasoline, or Diesel engines, available in many sizes for single or multiple use.

Young Shell and fixed or removable Tube Bundle Heat Exchangers are made in single- or two-pass styles, stocked for quick delivery and economy.

YOUNG

Heat Transfer Products for Automotive and Industrial Applications.

Young Quality — T. M. Reg. U. S. Pat. Off.

Heating, Cooling, and Air Conditioning Products for Home and Industry.

YOUNG RADIATOR CO., Dept. 200-B, Racine, Wis.

Plants at Racine, Wisconsin and Mattoon, Illinois

YOUNG RADIATOR COMPANY
Dept. 200-B, Racine, Wisconsin

I am interested in your combination cooling. Send me literature on both Jacket Water Coolers and Heat Exchangers.

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Company_____

Address_____

City_____ Zone____ State_____

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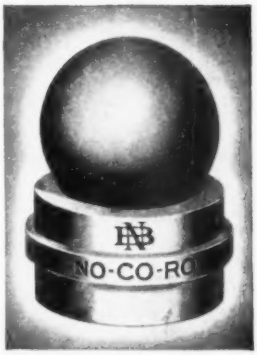
● For nearly half a century Norris Brothers, Inc., have specialized in the development of better steels as the *first* requirement of more efficient, longer-lasting valve checks. The resultant alloy—NO-CO-RO—is a truly remarkable metallurgical achievement. It resists the action of salt and acid. It will not pit, chip, or corrode—and it is available only in NO-CO-RO Balls and Seats and NO-CO-RO Drops and Seats.



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THE OIL AND GAS JOURNAL
BOX 1260 **TULSA 1, OKLA.**

EQUIPMENT MEN . . . in the News

Ames Joins Gar Wood As District Manager

G. S. AMES

E. D. Wallace, sales manager of the Findlay Division of Gar Wood Industries, has announced the appointment of George S. Ames as district manager. In accordance with the new Buckeye pipe-line policy, Ames' duties will be to contact with all pipeline contractors relative to their sales and service problems on Buckeye equipment.

Ames has had 25 years of experience working on pipe-line construction. He is familiar with the maintenance and repair of the Buckeye ditching machine, and has been general superintendent of pipe-line spreads.

Williams to Direct Core Lab Reservoir Engineering

Core Laboratories, Inc., Dallas, has announced a broadening of its reservoir-engineering department to offer more comprehensive service to the production industry.

Nelson W. Williams, recently appointed chief reservoir engineer, has been transferred from Core Lab's Bakersfield office where he served for the past 7 years as district engineer of the West Coast area, to the firm's main offices located in Dallas.

Williams, a graduate of Southern Methodist and Texas universities, has served in an administrative and technical capacity for Core Lab's since 1939.

American Brake Shoe Co. Opens Houston Office

American Brake Shoe Co. has opened a new sales office at Houston, to serve its customers in the Southwest territory. William C. George, who has been appointed sales engineer for the company in this territory, will represent Brake Shoe's American Manganese Steel Electro-Alloys and National Bearing Divisions in the new office. His activities will center in Oklahoma, Texas, and Louisiana.

George, formerly in the sales department of Electro-Alloys Division, has been with Brake Shoe since 1939, and was formerly associated with Carnegie Illinois Steel Corp. He is a chemical-engineering graduate of Purdue University.

Link, Amstutz Promoted by Oil Well Supply Co.

FRED E. LINK

G. M. AMSTUTZ

Fred E. Link, general works manager for Oil Well Supply Co., has been named to the post of assistant to the president, according to an announcement by Fred F. Murray, president.

Gordon M. Amstutz, chief industrial engineer for the past year, succeeds Link as general works manager.

Dillon Repurchases Climax Stock in Coupling Firm

S. V. Dillon has announced the repurchase of the stock of Dillon Co. from the Climax Division of General Finance Corp.

Dillon, president of Dillon Co., sold his interests to Climax during the war when materials were hard to get. The company manufactured the Dillon coupling which has been on the market the past few years under the name Climax Lock Coupling.

It is a grooved-type coupling with a two-part housing bolted together with a synthetic multiseal gasket insert that fits over the ends of the pipe and permits normal expansion and angular deflection of the line. The Dillon coupling is designed to compensate for stress and expansion of the line. It provides great flexibility without leakage and is especially valuable for pipe lines in earthquake areas, and in places where great temperature changes cause expansion and contraction of the line.

Lufkin Incorporates Canadian Subsidiary

CHARLES DYER

Lufkin Foundry & Machine Co., according to Walter W. Trout, president, has announced the incorporation of a Canadian subsidiary to be known as Lufkin Machine Co., Ltd., with headquarters at Edmonton, Alta.

Lufkin Machine Co., Ltd., will distribute and service all oil-field equipment manufactured by the Lufkin plant.

New headquarters consist of a two-story office building, a separate warehouse, and a large ground area for carrying complete stocks of Lufkin units, Gaso pumps, and repair parts.

Charles Dyer, long-time associate of Lufkin Foundry & Machine Co., has been appointed resident manager. He is undergoing a special training course now at the Gaso plant in Tulsa and, in this interim, W. T. Crowder, Jr., will be stationed at the Edmonton branch.

Officials of the new company will be: L. A. Little, president; A. E. Cudlipp, vice president; and M. L. Wilkinson, secretary-treasurer, with Charles Dyer and W. T. Crowder, Jr., assistant secretaries.

Youngstown Announces Sales Promotions

Youngstown Sheet & Tube Co. has recently announced several important personnel changes. Myron S. Curtis, formerly sales promotion manager, has been appointed assistant to the president. Roy A. Curl has been appointed manager of Youngstown's sales-promotion department succeeding Curtis.

John M. Tuthill has been advanced to manager of flat rolled sales for the company, succeeding Walter E. Scott, who retired the first of the year. L. E. Arnold, a salesman in the Detroit district sales office, has been transferred to Youngstown as assistant manager of flat-rolled sales, succeeding Tuthill.

Curtis joined Youngstown in 1911. In 1912 he became assistant superintendent of the conduit department at the Struthers plant and the following

(Continued on page 141)

CLASSIFIED ADVERTISING

Your MARKET PLACE FOR THE OIL AND GAS INDUSTRY...

DISPLAY CLASSIFIED
$12.00 a column inch one issue . . .
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EQUIPMENT FOR SALE

ROLAGRIP COUPLINGS—For Sale, 100 tons, 1½" to 8" inclusive. New, never used, complete with bolts and neoprene gaskets. Price 50% less than manufacturers selling price. Send for list. JULIUS M. FOGELMAN, Reading, Pa.

FOR SALE OR LEASE: Heavy duty oil well cementing truck. Equipment includes two 5 x 10 pumps. For details write Fred R. Holland, Box 3844, Odessa, Texas.

USED cable tools, sand reels, wire lines, and rotary drilling tools. E. A. Kelly, Box 861, Oklahoma City, Phone 5-6407.

FOR SALE

New and Used 48-L, 36-L, 28-L, 24-L, 22-W and 21-W Bucyrus-Erie Drills.

BEACON SUPPLY CO.
Box 398 Pampa, Texas Phone 3377

TANKS

3—Wyatt 10,000-Bbl. Welded Steel, 45' x 35' 7", cut down, match marked, complete W 8" vent and flame arrestor, ladder, nozzles, etc., excellent condition.

Location: Alice, Texas
Price: $6,000.00 each

Purchasing Department
SOUTHERN MINERALS CORP.
P. O. Box 716, Corpus Christi, Texas

FOR SALE

4—250 bbl. 4—500 bbl. low type
4—1,000 bbl. high type 4—1,500 bbl.
3— 5,000 bbl. 5—10,000 bbl.

All NEW closed A.P.I. bolted type steel tanks

4—NEW closed welded steel tanks 7'6" dia. x 13'6" long, 5/8" shell, 3/4" bulged heads

3—NEW vertical welded steel tanks with welded stands, 4'8" dia. x 18'8" high, 1½" thickness, bulged heads

16—Used horizontal welded steel tanks 8' dia. x 30' long, ¼" thickness, approx. 12,000 gal.

20—Used vertical welded steel tanks, like glass enameled inside, 10'4" dia. x 17'4" high, 3/8" shell, dished heads

100—Used closed vertical Cypress WOOD tanks, approx. 10' diameter, from 8' to 18' high, complete with round hoops and lugs

We carry large quantities in stock for immediate shipment of New and Guaranteed Used steel PIPE and TUBING up to 30" in diameter.

Your inquiries will be appreciated.

A. GREENSPON PIPE CO., Inc.
3615 Olive St. St. Louis 8, Mo.
LUcas 5651

EQUIPMENT FOR SALE

FOR SALE: Two steel mud tanks, 5 feet by 8 feet; 30 feet long, made of ¼" steel, sloping bottom. Never been used. $3200. Located Makin Drilling Company's yard, Hobbs, New Mexico.

FOR SALE: 1—36-L Bucyrus Rig, 1948 model, complete with all tools. Phone 2032, Henderson, Kentucky.

FOR SALE—COMPLETE POWER RIG: Three years old—Running at Winters, Texas—Twin Engine Cardwell Draw Works, 7500 foot capacity—WAK Waukesha Engines —7¼ by 14 inch Oilwell Pump—5000 feet 1½ inch Drill Pipe—Brand new mud mixer, Spinning cathead—$35,000. Contact Ernest Baccus, 700 Thompson Street, Kilgore, Texas. Phone 2297.

ONE Skid mounted 5 x 10 Gardner Denver Pump with 525 Buda Engine used to drill five shallow holes—$3000.00. Riverside-6811, Dallas, Texas.

FOR SALE—HYDRAULIC CASING PULLING MACHINE

Mounted on 1947, 1½ Ton Dodge Truck —complete unit to pull 5½"-7" O.D.— 8⅝" and 10¾" Casing. Gin poles—steel dog house. Rex centrifugal pump and all necessary tools.

J. F. SMITH
Phone L.D. 33
302 Masonic Building Shawnee, Okla.

STANDARD BLACK PIPE

Reconditioned

30,000 feet—1½" 25,000 feet—1¼"
35,000 feet—2"
P. E. or T. & C.
to meet your requirements.
Write—Wire—Phone

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EQUIPMENT FOR SALE

FOR CABLE TOOLS
DEGEN PIPE AND SUPPLY CO.
Box 107, Red Fork Station, Tulsa, Oklahoma

SEISMOGRAPH EQUIPMENT FOR SALE: Two 2-Ton Chevrolet Coleman 4-Wheel Drive water trucks. 500 gallon tank completely winterized, vacuum fill, Tulsa winch, etc. Excellent condition, low mileage. Original Cost $6600.00—Sale Price $4000.00.

One 1½-Ton Chevrolet crew and field service unit. Bed enclosed with steel, cab with heater, 65 gallon gas tank with gear pump. 7:50 x 15 tires. Low mileage. Original Cost $2800.00—Sale Price $1800.00. Riverside-6811, Dallas, Texas.

EQUIPMENT FOR SALE: 1 Clark engine and compressor, engine 80 hp., size 16" x 15" x 7¼" x 20", 200 r.p.m. compressor, intake pressure 0 pounds discharge pressure 350 pounds, type Q compressor cylinders.

1 Bruce-McBeth gas engine, 200 hp., 4 cylinder size 13" x 16", serial 485.

Equipment second hand, in good condition.

American Liberty Oil Company, Box 1011, Mt. Pleasant, Texas.

PRESSURE VESSELS
Description and Price

1—Debutanizer, J. B. Beaird, 30" x 63', 36 removable trays, 150 psig. working pressure. $1,260.00
1—Secondary Still, J. B. Beaird, 36"-x 54', 20 removable trays, 50 psig. working pressure. $1,150.00
1—Reabsorber, J. B. Beaird, 36" x 41', 22 removable trays, 90 psig. working pressure. $1,075.00
2—Absorbers, Tulsa Boiler, 84" x 45', 16 fixed trays, one double mist extractor, 80 psig. working pressure. Each $2,500.00
2—Scrubbers, Tulsa Boiler, 84" x 10', one double mist extractor, 80 psig. working pressure. Each $550.00

All above in excellent condition.

Location: First three items—Alice, Texas. Last two items—Bishop, Texas.

Purchasing Department
SOUTHERN MINERALS CORP.
P. O. Box 716, Corpus Christi, Texas

LINE PIPE FOR SALE

90,000' 8⅝" OD 28.55# LW Line Pipe No. 1
25,000' 8⅝" OD 28.55# LW Line Pipe No. 2
40,000' 6⅝" OD 18.97# Electric weld Line Pipe No. 1
15,000' 6⅝" OD 18.97# Lapweld Line Pipe No. 1
18,000' 4½" OD 10.79# LW Line Pipe

All double random lengths, cleaned, straightened and bevelled. This pipe previously used in an oil line is ready for immediate shipment from Guthrie, Oklahoma.

Herman Kaiser Pipe & Supply Co.
819-20 Palace Building
Tulsa, Oklahoma
Tel.: 3-3413 4-6358 At Night 5-8633

EQUIPMENT FOR SALE

MUD Hog Pump 7¼ x 12 Gardner-Denver, and other drilling equipment. See at Garrett Equipment Co., Wichita Falls. Make an offer to D. F. MacKinnon, 3200 Main Street, Dallas, Texas, Phone C-6415.

FOR SALE: Approximately 15,000 feet of 6" OD "Invasion" Steel Pipe, Wt. about 9#, $6^5/_8$" OD Plain Ends, 20' lengths. New condition. Also, approximately 15,000 feet of $6^5/_8$" OD Plain End Stand Black Steel Pipe, No. 2 Grade. M. KAPLAN & SON, Box 1883, Phone 942, Monroe, Louisiana.

FOR SALE, south of Wewoka in the Fish Pool: 21,000' of 4" OD boiler flue oil line. 15 cents per foot as is. 25 cents per foot taken up. Cities Service Oil Co., Patridge, Bartlesville, Oklahoma.

HIGH PRESSURE PIPE

31,600'—7" OD 27.73# Seamless Range 2, Beveled. Excellent Condition.

Location: Alice, Texas

Price: $1.75 Foot

Purchasing Department

SOUTHERN MINERALS CORP.

P. O. Box 716, Corpus Christi, Texas

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100 Octane Gasoline Refinery

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Tanks, towers and vessels.
Pumps, turbines and motors.
Heat exchangers and condensers.
Laboratory equipment.
Pipe—valves and fittings.
Boilers.
Instruments and controls.

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DULIEN STEEL PRODUCTS, INC.
of Washington
P. O. BOX 667
COTTON VALLEY, LA.
PHONE: COTTON VALLEY 26

EQUIPMENT FOR SALE

EQUIPMENT: New and used spudders, rotaries, core drills; cable tools, drill pipe, PK rods. Everything for well service. We rent fishing tools. Pressey & Son, Pueblo, Colorado.

FOR SALE at our Barnsdall warehouse: 665' 13" OD 50# used Lapweld Casing. $2.25 per foot, take all. Cities Service Oil Co., Patridge, Bartlesville, Okla.

FOR SALE: 3 New 10,000 bbl. A.P.I. Columbian Bolted Steel Tanks. 160—8000 & 10,000 Gal. Tank Cars. Darien Corp., 60 E. 42nd St., N. Y., N. Y.

FOR SALE at Hobbs, N. M.: 1—Used Allis Chalmers Model UM-4 Skid Well Servicing Unit, $1350.00. Cities Service Oil Co., Patridge, Bartlesville, Oklahoma.

Several Army Surplus 4½" x 6" Gasoline Duplex 1860 Pumps — two piece skid mounted with Chrysler 8 cylinder engines. Will sell pumps only or complete units about half price.

H. H. COFFIELD
ATTN: W. H. Orr
Phones: 132—Rockdale, Texas
A-86064—Houston, Texas

FOR SALE

Link Belt Roto Louvre rotary dryer 10'x30', (for fullers earth, etc.) w all accessories, 1947, A-1.
Diesel-electric generators (6) 1000 KW.
Diesel Locomotives (5) 25—45 tons.

H. Y. SMITH CO.
Milwaukee 2, Wis.

USED WATER TUBE BOILER

210 H.P. 200# W.P. Erie City 3 drum boiler Tubes and Drums in perfect condition. Price $6280. F.O.B. Cotton Valley, La.

MOORE & COMPANY
601 Oil Capital Bldg., Ph. 2-0058
Tulsa, Okla.

FOR SALE—Two Bucyrus Erie Spudders, one 28L and one 36L. Both have 60 foot masts and auxiliary A-Frames. 28L powered with Caterpillar D-315 diesel engine. 36L powered with Cummins H-Series diesel engine. Both rigs like new. Dog houses, light plants, and all necessary hand tools included. Prices: 28L $10,000 and 36L $15,000. Terms if desired. Also have approximately 25 tons of cable tools at 5 cents per pound. **Cable Tool Drilling Co.**, 1444 East Hill St., Long Beach, Calif. Phone 47533.

VALVES

7—6" Merco-Nordstrom Plug Valves, Fig. No. 18849 (3049). Each $525.00
2—8" Merco-Nordstrom Plug Valves, Fig. No. 18849 (3049). Each $330.00

All above in good condition.

Location: Alice, Texas

Purchasing Department

SOUTHERN MINERALS CORP.
P. O. Box 716, Corpus Christi, Texas

EQUIPMENT FOR SALE

FOR SALE at Oklahoma City—1 Hobart Skid Type 300 Amp. Model GR Welding Machine driven by 63 HP Chrysler Engine, completely overhauled. $650.00. Cities Service Oil Co., Patridge, Bartlesville, Okla.

UNION Hot Oil Pump—24 x 44 x $45/_8$ x 24 cross compound crank-and-flywheel plunger type. Good condition. Serial No. 200999. Suitable for 1,000 PSI discharge pressure at 700 F. Stainless metallized plungers. You may inspect at any time. Make offer, F.O.B. Cheyenne. The Frontier Refining Company, P. O. Box 418, Cheyenne, Wyoming.

FOR SALE: One D-13000 Caterpillar, Diesel engine. Extra good condition, only 2000 hours operation. The Ramsey Petroleum Company. Attention: J. H. Wagner, El Dorado, Kansas.

OIL STORAGE TANKS

FOR SALE greatly below cost. One 1,000-bbl. and two 500-bbl. tanks—bolted, steel construction. Company in receivership. Box D-337, The Oil and Gas Journal, Tulsa, Oklahoma.

WAR SURPLUS MACHINERY

Gaso, Byron Jackson, Aurora, Wayne, Lombard, & Hale Fire Pumps with Engines, 1½ to 25 KW Generator Sets or Light Plants, Engines, Suction Hose, Fire Hose, Victaulic Couplings & Etc. Write for listing. H. A. McCarthy, 310 Thompson Bldg., Phone 5-3296, Tulsa, Oklahoma.

FOR SALE: We are taking up in the Fish Pool south of Wewoka, a large quantity of 2", 3", and 4" line pipe. All should be available within 30 days. Cities Service Oil Co., Patridge, Bartlesville, Oklahoma.

FOR SALE: 1—Cardwell K Double Drum Unit unitized with GAK Waukesha. 1—$7^1/_4$" x 18 Model 7P Wilson-Snyder Pump. 1—$7^1/_4$ x 12 Clark Triplex Pump. 1—$7^1/_4$ x 10 Model EE-PXD Gardner-Denver Pump. 1—4 x 6 Fig. 6161-A Fairbanks-Morse Pump. 1—$13^3/_8$ x 3 Union Triplex Glycol Pump. 2—D13000 Caterpillar Diesel Engines. 2—PA100 International Engines. 1—$7^5/_8$ x $83/_4$ Hughes Type J Core Barrel. 1—A250 Bethlehem Crown Block. 1—Deckard Monkey Board for 136'-30' Base Derrick. 1—Hunt Tool Monkey Board for 129'-24' Base Derrick. 1—$13^3/_8$ SDA Cameron Blowout Preventer c w $13^3/_8$ Pressure Operated Gate Valve. 1—Set (2) 7'4" Wade x 10' high x 21' long Substructure c w walkways, handrails, and steps. 1—Type B-6 Emsco Swivel. 10—$5^1/_4$" OD x 30' Drill Collars in tandem of 5 each. 3—5" OD x 26' Drill Collars. 1—24" x 48" Link Belt Mud Screen c w Model AEH Wisconsin Motor.

All equipment completely overhauled.
M. ROSENBLOOM PIPE & SUPPLY CO., INC.
P. O. Box 1328 Phone 4-2601
Shreveport, Louisiana
Specializing in Drilling Equipment

FOR SALE: At our Pampa Gasoline Plant —1-4' O.D. x 40' long, Propane Storage Tank. Code Vessel 200# at 250 F. Price $750.00 new 1940. Cities Service Oil Co., Patridge, Bartlesville, Oklahoma.

PACKAGED H_2S REMOVAL UNITS

We offer prompt shipment on skid-mounted hydrogen sulfide removal units for treating sour gas for pipe line or fuel gas purposes.

GRAFF ENGINEERING & EQ'PT. CO.
3415 Westminster, Dallas 5, Texas

EQUIPMENT WANTED

WANTED: COMPLETE #6 Baker, cable tool, coring barrel. Write condition, location and price: Williams Oil Co., 915 South Main, Ottawa, Kansas.

HELP WANTED

DRILLERS experienced on Sullivan #200 core drill. State age, experience, salary expected and reference. Box D-379, The Oil and Gas Journal, Tulsa, Oklahoma.

JUNIOR ENGINEER wanted by independent oil company operating in West and West Central Texas. Must be recent graduate with petroleum engineering degree. All replies should contain outline of training, past experience, if any, age, marital status, date of availability, and starting salary desired. Recent photo or snapshot would be helpful. Address Box D-342, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE

1—Used Emsco J-1250 Heavy Power Rig complete with 3—Superior 6G-510 Gas Engines.

Excellent condition. Attractive price.

The National Supply Company

Fort Worth, Texas

HELP WANTED

WANTED: Design Engineer. Graduate Mechanical Engineer with experience in design of pumps, meters, controls and/or allied equipment used in petroleum industry. Age: 30 to 40 years. Excellent opportunity with well established firm. Inquiry confidential. Reply giving full particulars to Box D-382, The Oil and Gas Journal, Tulsa, Oklahoma.

SALESMAN experienced in Houston Territory as Oil Field or Industrial Salesman. Inside or outside experience. Room for advancement in established supply company. Please send complete data, experience, age. Box D-356, The Oil and Gas Journal, Tulsa, Oklahoma.

NEW foreign and domestic Oil Employment Directory. Over 500 listings in drilling, production, refining, natural gasoline, pipe lines, geological, exploration, supplies, manufacturers, services; and trucking, refinery and pipe line contractors, showing where to apply for jobs. Price $5.00. Oil Industry Mailing List, Box 2603, Tulsa, Okla. (Our 28th year).

HIGH type, responsible executive wanted as Manager Latin-American operations for substantial independent producing company entering foreign operations. Applicant should be college graduate, under 40 years of age; have minimum 15 years' experience in production and drilling work, particularly in high pressure oil and gas well completions. Applicant should speak Spanish fluently, have thorough experience in development Geology, be equipped to prepare and maintain adequate reservoir and engineering studies including repressuring and pressure maintenance. Excellent compensation. When replying, give full details. Our present employes not considered for this position. Box D-364, The Oil and Gas Journal, Tulsa, Oklahoma.

WTD: PROCESS ENGINEER: Major engineering contractor expanding service needs process engineer with minimum five years experience in process design of refinery and gasoline plant units. Man with experience in operation will be favored. Reply should contain summary past experience and training, date of availability, and starting salary. Box D-365, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED: Mechanical design engineer and draftsman with minimum three years' experience oil refinery piping engineering. Engineering degree preferred. Permanent positions for qualified men. Give complete review experience record with application. Address E. M. Skinner, Chief Engineer, Socony-Vacuum Oil Co., Inc., Augusta, Kansas.

SALESMAN WANTED who calls on refineries, tool and instrument manufacturers, to offer a specialty sideline with good profit possibilities. Tulsa Cabinet and Fixture Co., 2545 East Admiral Place, Tulsa, Oklahoma.

WANTED: Engineer with experience in core analysis to supervise routine laboratory and research work and interpret routine results. Advanced degree preferred. Salary open. State experience, education, and salary expected. Continental Oil Company, Personnel Division, Ponca City, Oklahoma.

WANTED: Instrument man with experience in oil refinery and chemical plant instruments. Denver location. State age, experience, and salary expected, in first letter. Box D-373, The Oil and Gas Journal, Tulsa, Oklahoma.

SALES AGENT wanted by well established Oil and Gas production equipment manufacturer. Three territories available (1) Illinois, Indiana, Michigan and Ohio, (2) Texas Panhandle and North New Mexico, (3) South Texas. These territories offerred on exclusive contract to capable man on commission basis. Prefer Graduate Mechanical or Petroleum Engineer with five to ten years field or selling experience. Line of equipment includes Oil and Gas Separators, Wellcheckers, Free Water Knockouts, oil, water, and gas meters, Liquid Level Controls, Pressure Regulators, Chemical Pumps, and other items. Reply Box D-376, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE—MAPS

CURRENT East Texas Field salt water encroachment maps. In colors. Scale 1" = 2000'. $65.00 each. C. L. Anstine, Route 1, Kilgore, Texas.

SITUATIONS WANTED

CHEMICAL ENGINEER: Three years' experience process engineering and operations technology, catalytic cracking, absorbtion, crude running. Seeking position as process engineer and/or operations technologist, refinery engineer. Age 28, family. Box D-366, The Oil and Gas Journal, Tulsa, Oklahoma.

GRADUATE petroleum and geological engineer, 25, desires position home or abroad. Excellent references. Box D-369, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOLOGIST: B.S. degree. Experience in West Texas, New Mexico, North Central Texas, Mid-Continent area, and Illinois, desires position with aggressive company. P. O. Box 183, Tulsa, Oklahoma.

DESIRES CHANGE: Refining and Production Material Man, Experienced in Auditing, Inventory, Control, Purchasing and Sales. Can furnish the best of references. Age 35, Box D-302, The Oil and Gas Journal, Tulsa, Oklahoma.

ATTENTION: Well established oil well drilling contractor desires to manage and supervise: Individuals', groups', small or medium-sized oil companies' drilling, production and operating problems in Central and Western Texas, and New Mexico. Personal interview by appointment is desired. Makin Drilling Company, Box No 131, Ph. No. 131, Hobbs, New Mexico

MATERIAL, purchasing and accounting experience. Production and refinery sales in office and store. 19 years with major supply company. Age 36. Married. Appreciate full particulars in reply. Box D-374, The Oil and Gas Journal, Tulsa, Okla.

19 YEARS experience in natural gasoline plant and cycling operations—15 years in supervisory capacity. I am fully qualified to operate and manage any size or type of gas processing plant. Can furnish good references upon request. Available immediately. C. L. Chewning, General Delivery, Kermit, Texas. Telephone 176-M.

MECHANICAL Designer—machines, tools, products, development work, top hand. Available soon. Write Box D-375, The Oil and Gas Journal, Tulsa, Okla.

MECHANICAL ENGINEER

Three years oil refinery maintenance and construction, two years design of rotary drilling rigs, desires position with independent oil operator or drilling contractor. Box D-378, The Oil and Gas Journal, Tulsa, Oklahoma.

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ATTORNEY-CHEMIST, 29, B.S., 3 years experience refinery and research. LLB Tulane June, 1950. High Scholastic standing. Desires position with firm which can utilize background and experience. Will be admitted Louisiana Bar June. Box D-381, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE

FOR SALE: Structural Steel Bldg. 30'x56'x10' Walls. Heavy construction. Price $1100.00 F.O.B. Okla. City, Phone 5-6407.

FOR SALE OR TRADE: One Twin-Motor Beechcraft, fully equipped for all types of flying. Would be especially interested in securing an oil payment. Box D-372, The Oil and Gas Journal, Tulsa, Oklahoma.

PATENT ATTORNEYS

PATENT Practice before U. S. Patent Office. Validity and Infringement Investigations and Opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommell, Registered Patent Attorneys, Suite 418 815-15th Street, N.W., Washington 5, D. C.

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5,000 ACRES Chaves County, New Mexico, 5S 29E. New 10-year lease, rentals paid to 9-1-52. $5.00 plus 3% override or will make attractive drilling deal. H. N. Sweeney, 404 Shipp Drive, Hobbs, N. M.

WYOMING-POWDER River Basin, Southwest edge, Continental Oil to drill Lakota test. Will sell royalty and lease. Box D-354, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: Oil and Gas Leases and drilling propositions in shallow territory of Allen, Simpson, and Warren Counties, Kentucky, W. P. Harley, Bowling Green, Kentucky.

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Box D-359, The Oil and Gas Journal, Tulsa, Oklahoma

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THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

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EQUIPMENT MEN

(Continued from page 137)

year was made general foreman of the tube galvanize department. In 1929 he was appointed advertising manager and the following year manager of sales promotion.

Curl joined Youngstown in 1925 and in 1935 was made assistant to the sales-promotion manager. Tuthill joined Youngstown in 1935 as assistant manager of the flat rolled sales department and Arnold became a salesman in the Detroit office of Youngstown in 1934.

Worthington Engine Names New Eastern Manager

Appointment of A. M. Boehm as eastern manager, engine division, has been announced by John J. Summersby, vice president in charge of sales, Worthington Pump & Machinery Corp.

Boehm will handle sales negotiations for gas and oil pipe lines equipment and oil and gas engines for all services, and will continue to make the firm's New York district office his headquarters.

Boehm has served Worthington for 25 years as an engine sales specialist assigned to various district offices throughout the country. He succeeds W. L. Russell, who has been assigned to handle Canadian sales for the John Inglis Co., Worthington's Canadian associate.

Buda Sales Meeting Features Buda 2505 Engine

Attending a Buda Engine Sales & Service sales conference held in Tulsa in January are: (back row) L. B. Lassiter, Tulsa; J. S. Maxwell, Seminole, Okla.; R. E. Miller, Salem, Ill.; G. L. Temple, Tulsa; L. E. Williams, Denver; C. M. Lackey, Tulsa; T. J. Howard, Tulsa; V. B. Stover, Tulsa; and C. C. Britton, Tulsa. Middle row: J. C. Baseheart, Dallas; J. A. Malroney, Tulsa; W. F. Legg, Oklahoma City; A. C. Holt, Casper, Wyo.; L. R. Whitefield, Tulsa; C. B. Stanley, Tulsa; R. S. Culley, Tulsa; and T. J. Plummer, Oklahoma City. (Front row) Bo Jennings, Oklahoma City; J. B. Reavis, Oklahoma City; H. C. Postlethwaite, Denver; C. H. Mehlhorn, Tulsa; Buddy Arndt, Tulsa; E. M. Gardner, Great Bend, Kans.; and C. E. Wright, Tulsa.

Metal Goods Corp. Holds Annual Sales Meeting

R. E. GROTE

Metal Goods Corp., of Tulsa, held its annual sales meeting at Hotel Tulsa January 31. This was one of a series of such annual meetings which were held during the week of January 30 throughout the Metal Goods branches in the Southwest.

R. E. Grote, president of Metal Goods, presided at these meetings which were held in Kansas City, Tulsa, Dallas, Houston, and New Orleans and which were attended by sales representatives from the entire southwestern territory.

Accompanying Grote were members of Metal Goods executive staff including: L. B. Atkins, secretary; H. S. Reasor, vice president; C. P. Baumunk, vice president; T. G. Rankin, manager accessories division; and Ray Cox, advertising manager.

Metal Goods Corp. covers the entire southwestern and midwestern group of states in the warehousing, sale, and distribution of mill products produced by Aluminum Co. of America, American Brass Co., Armco Steel Corp., International Nickel Co., and others.

Myers Is Sales Manager of E-P Industrial Insulation

W. D. MYERS

C. B. Lynde, vice president and general manager of the Insulation Division of Eagle-Picher Sales Co., has announced the resignation of Douglas Via as sales manager of the industrial insulation department of the company.

At the same time, Lynde announced the appointment of Walter D. Myers, Jr., to succeed Via. Myers has been with Eagle-Picher for 5 years.

Myers' previous training includes 4 years at Purdue University where he studied chemical engineering, and 1 year at University of Louisville, in electrical engineering. Before his service with Eagle-Picher, Myers spent 10 years as superintendent of Corhart Manufacturing Co., a unit of Corning Glass Co., manufacturers of refractories.

Patterson-Ballagh Products Stocked by I.C.I. Stores

International Cementers, Inc., service is now stocking Patterson-Ballagh oil-field specialties in the Rocky Mountain area, according to Bob Harcus, executive vice president and general manager of I.C.I.

P-B wipers, bumpers, wire-line guides and stabilizers, production products, and other P-B products will be available through each of I.C.I.'s service points in the Rocky Mountain area.

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CALENDAR

February

American Institute of Mining and Metallurgical Engineers, annual meeting, Hotel Statler, New York, February 12-16.

American Society for Testing Materials, Committee D-2 on Petroleum Products and Lubricants, Washington, February 20-24.

Western Petroleum Refiners Association, regional technical meeting, Washington-Youree Hotel, Shreveport, February 24.

American Institute of Chemical Engineers, regional meeting, Houston, February 26-March 1.

American Society for Testing Materials, spring meeting, Hotel William Penn, Pittsburgh, February 27-March 3.

March

American Petroleum Institute, Division of Production, Southwestern District meeting, Adolphus Hotel, Dallas, March 8-10.

Texas Independent Producers and Royalty Owners Association, fourth annual meeting, Baker Hotel, Dallas, March 9.

Indiana Independent Petroleum Association, spring convention, Hotel Severin, Indianapolis, March 9-10.

American Chemical Society, Houston meeting, Shamrock Hotel, Houston, March 26-30.

North Texas Oil and Gas Association, Kemp Hotel, Wichita Falls, March 25.

Southern Gas Association, Galveston, Tex., March 27-29.

Western Petroleum Refiners Association, annual meeting, Plaza Hotel, San Antonio, March 27-29.

American Petroleum Institute, Division of Production, Mid-Continent district meeting, Skirvin Hotel, Oklahoma City, March 29-31.

April

American Petroleum Institute, board of directors meeting, Houston, April 3-4.

National Association of Corrosion Engineers, annual conference, Jefferson Hotel, St. Louis, Mo., April 4-7.

American Chemical Society, Philadelphia meeting, Philadelphia, April 9-13.

American Society of Lubrication Engineers, annual convention, Hotel Statler, Detroit, April 10-12.

American Society of Mechanical Engineers, Hotel Statler, Washington, D. C., April 10-14.

Southwestern Gas Measurement Short Course, University of Oklahoma, Norman, Okla., April 11-13.

National Petroleum Association, Hotel Cleveland, Cleveland, Ohio, April 12-14.

American Petroleum Institute, Division of Production, Rocky Mountain district meeting, Gladstone Hotel, Casper, Wyo., April 13-14.

American Chemical Society, Detroit meeting, Detroit, April 16-20.

Petroleum Industry Electrical Association and Petroleum Electric Supply Association, joint conference, Shamrock Hotel, Houston, April 18-20.

Natural Gasoline Association of America, annual convention, Texas Hotel, Fort Worth, April 24-26.

American Association of Petroleum Geologists, Society of Economic Paleontologists and Mineralogists, and Society of Exploration Geophysicists, joint annual meeting, Stevens Hotel, Chicago, April 24-27.

Oil Heat Institute of America and National Oil Heat Exposition, annual meeting, Commercial Museum, Philadelphia, April 24-May 1.

American Petroleum Institute, Division of Production, eastern district meeting, Cleveland Hotel, Cleveland, April 26-28.

May

American Petroleum Institute, Division of Refining, midyear meeting, Hotel Cleveland, Cleveland, May 1-4.

Interstate Oil Compact Commission, spring meeting, Biloxi, Miss., May 4-6.

Independent Petroleum Association of America, midyear meeting, Biltmore Hotel, Los Angeles, May 7-9.

American Gas Association, Natural Gas Department, spring meeting, Mayo Hotel, Tulsa, May 8-9.

American Petroleum Institute, Division of Production, Pacific Coast district meeting, Biltmore Hotel, Los Angeles, May 11-12.

Gas Technology Short Course, Texas College of Arts and Industries, Kingsville, Tex., May 29-31.

June

Pennsylvania Grade Crude Oil Association, Hotel William Penn, Pittsburgh, Pa., June 15-16.

American Society of Mechanical Engineers, Hotel Statler, St. Louis, June 19-23.

American Society for Testing Materials, annual meeting Chalfonte-Haddon Hall, Atlantic City, N. J., June 26-30.

August

Interstate Oil Compact Commission, summer meeting, French Lick, Ind., August 3-5.

September

American Society of Mechanical Engineers and Instrument Society of America, Municipal Auditorium, Buffalo, N. Y., September 11-15.

National Petroleum Association, Hotel Traymore, Atlantic City, N. J., September 13-15.

American Society of Mechanical Engineers, petroleum mechanical engineering conference, Roosevelt Hotel, New Orleans, September 25-27.

October

American Gas Association, annual convention, Atlantic City, N. J., October 2-6.

Mid-Continent Oil and Gas Association, Texas division, Dallas, October 4-5.

American Association of Oilwell Drilling Contractors, annual meeting Mayo Hotel, Tulsa, October 9-10.

November

American Petroleum Institute, annual meeting, Biltmore and Ambassador Hotels, Los Angeles, November 13-16.

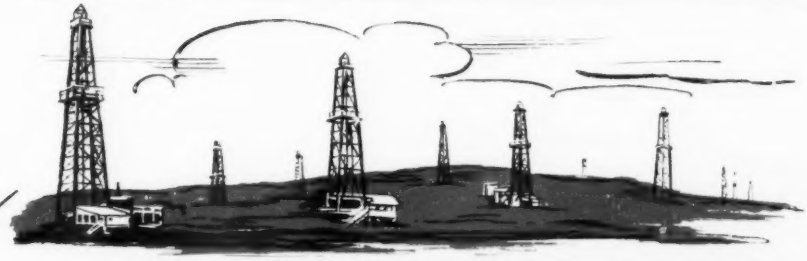
NOMADS

Tulsa Nomads, third Friday of each month. After Five Room, Tulsa Hotel.

Dallas Nomads, first Monday of each month, Texas Room, Baker Hotel.

Houston Nomads, second Monday of each month, Ye Ole College Inn, Houston.

Los Angeles Nomads, second Wednesday of each month, Jonathan Club.



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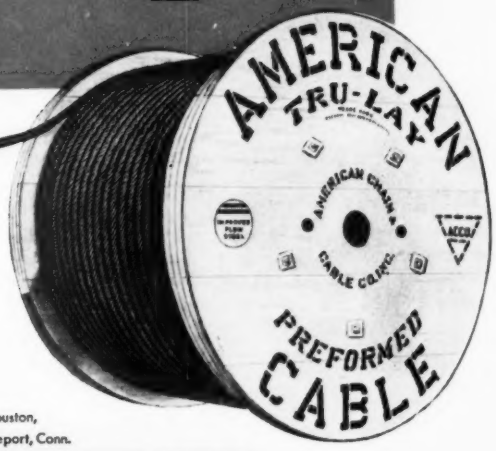

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Kent Morgan's Hundred Octane "*Bourbon*"

Kent Morgan, fabled colossus of the oil industry, was a man of science as well as a man of feats of strength in petroleum history. His scientific achievements, however, ofttimes came his way quite by accident.

Veteran oil men contend that in the year of the great drought at the turn of the century there were crop failures all over the country and no grain was harvested. Morgan, who for years had made his own liquor, felt the corn crop failure deeply; so in experimenting with crude oil in his still as a substitute for grain, he came up with a pretty fair grade of combustible petroleum. Lighting his pipe one cold winter day after quaffing a great portion of his newly distilled potion, Morgan's breath, blown over the match, started a forest fire.

Old-timers point out that it was indeed Kent Morgan's "discovery" of the refining process that was to make the combustion engine feasible; hence, Morgan, was responsible for the future of the automobile.

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